

ATTACHMENT TO AGENDA ITEM

Ordinary Meeting

19 February 2019

**Agenda Item 11.5 Council Submission to Draft Solar Energy Facilities
Design and Development Guidelines**

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DRAFT - Solar Energy Facilities

Design and Development Guidelines



Department of Environment, Land, Water and Planning

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Introduction

These guidelines outline the assessment and development process for large-scale solar energy facilities in Victoria and provide advice on how potential impacts can be avoided or effectively managed. These guidelines will inform the development of positive and appropriate projects that enhance communities and support the transition to a clean and prosperous energy system.

They have been developed to provide information for applicants, the community, regulators and responsible authorities. The responsible authority for solar energy facility planning permit applications under the *Planning and Environment Act 1987* and planning schemes is the local council.

These guidelines apply only to large-scale facilities, and do not apply to solar panel arrays that supply energy for an existing use of the land on which they are located. The first section, **Policy, Planning and Legislative Requirements**, sets out the framework in Victoria for planning and assessing proposals for solar energy facilities. The second section, **Best Guidance for Proponents**, gives proponents guidance on improving the quality of their development proposal, and effectively engaging with, and minimising impacts on, local communities.

What are solar energy facilities?

Solar energy facilities harness energy from the sun to generate electricity. The most common solar energy facilities use photovoltaic (PV) solar panel arrays. Concentrated solar thermal (CST) technologies are less common, although several facilities are in operation overseas and under development in Australia.

PV solar technologies consist of solar panels containing groups of photovoltaic cells that convert sunlight directly into electricity. These panels are usually set out in arrays that are connected to inverters and associated controls that convert the direct current (DC) electricity generated by the panels into alternating current (AC) and distribute it through the electricity grid.

CST technologies use reflectors or heliostats (mirrors) to focus sunlight on a receiver to heat a fluid, molten salt or another medium, which in turn produces steam or hot air. The steam is then used to drive a turbine connected to a generator to produce electricity.

Battery storage may also be an important component of a solar energy facility, particularly as technology in this area develops.

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Policy, Planning and Legislative Requirements

Solar energy facilities provide a clean source of energy generation and contribute to the reduction of greenhouse gas emissions. Their development will form part of Victoria's transition to a modern, renewable energy supply. Growth of the renewable energy industry also brings significant investment into regional areas, creating new jobs in construction and ongoing employment in facility operation and maintenance.

Co-locating solar energy facilities with agricultural production can also help stabilise farm incomes, which can fluctuate due to changing commodity prices and climatic patterns.

Most well-sited and carefully designed solar energy facilities have minimal impacts on surrounding communities, the environment and on agricultural activities. However, significant land use change can raise concerns across communities about potential impacts, which is why public engagement is an important part of the development process for solar energy facilities.

Proponents and regulatory authorities should consider:

- relevant government policy
- appropriate site location - analysis of opportunities and constraints
- regulatory requirements
- best practice design and development features
- early and effective community engagement.



1. State policy directions

Proposals for development of solar energy facilities must reflect the Victorian Government's key policy directions which include renewable energy, water, regional development and agriculture, and biodiversity. Solar energy facility proponents should consider state policy objectives and priorities early in the planning stages and site selection process.

1.1 Renewable energy

The Victorian Government has committed to renewable energy targets to ensure an affordable, reliable and renewable energy future for Victoria. To progress this goal, Victoria's Renewable Energy Target (VRET) requires increasing renewable energy generation to 25 per cent by 2020 and 40 per cent by 2025. The VRET policy also encourages investment in energy storage and new energy technologies, and is supported by [Victoria's Renewable Energy Action Plan](#).

1.2 Water

[Water for Victoria](#) (2016) sets out water policy in Victoria and long-term strategies for managing the state's water resources. The plan highlights the importance of rural water infrastructure for future growth in the agriculture sector, and emphasises the need to maximise benefits for the community when considering questions of land use change and the water grid.

1.3 Regional development and agriculture

[Victoria's Regional Statement](#) (2015) recognises the diverse and changing components of the regional economy, including food, fibre, wine, tourism and renewable energy. The Statement highlights the significant job opportunities expected to emerge in the new energy industries that will drive this transition and defines nine Regional Partnership areas across the state.

The Statement also identifies key investments and strengths that underpin the potential of these areas, including the [Goulburn Murray Water Connections project](#), a \$2 billion rejuvenation of the Goulburn Murray Irrigation District. The Statement notes that prime agricultural land is a priority for this area.

The [Agriculture Victoria Strategy](#) (2017) identifies food and fibre as a priority industry sector, and recognises that Victoria is well placed to meet the demand for many high-value and high-quality products such as nuts, fruit and wine, along with dairy and meat products.

[Regional growth plans](#) provide broad direction for land use and development across regional Victoria.

1.4 Biodiversity

In Victoria, there is a range of legislation to protect biodiversity. The relevant biodiversity requirements are outlined in these guidelines.

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2. Planning policy framework

As part of the [Victoria Planning Provisions \(VPP\)](#) under the [Planning and Environment Act 1987](#), the Planning Policy Framework (PPF) contains state-level policies on land use and development in Victoria.

[Clause 19.01-1S Energy supply](#) aims to facilitate appropriate development of energy supply infrastructure. The objective of this clause is to support the transition to a low-carbon economy through renewable energy development and greenhouse gas emission reductions.

State planning policy recognises that local energy generation developments help diversify the local economy and improve sustainability outcomes. The policy supports the development of energy facilities in appropriate locations to take advantage of existing infrastructure and provide benefits to industry and the community.

[Clause 19.01-2S Renewable energy](#) has the objective to promote the provision of renewable energy facilities that meet appropriate siting and design considerations. When assessing proposals

for renewable energy, a key strategy is to consider the economic and environmental benefits to the broader community from renewable energy generation, while considering the need to minimise any adverse effects on the local community and environment.

Other relevant sections from the PPF include:

- Clauses on planning in regional Victoria, including regional growth plans
- Clause 12.01 'Biodiversity'
- Clause 12.05 'Significant environments and landscapes'
- Clause 13 'Environmental risks and amenity'
- Clause 14.01 'Agriculture – Protection of agricultural land'
- Clause 14.02 'Water'
- Clause 15.02 'Sustainable development'
- Clause 17 'Economic development'

3. The Victorian electricity transmission network

Large solar energy facilities connect into the National Electricity Market (NEM) through the Victorian electricity network. Electricity generated from the solar energy facility is transported via high voltage transmission lines to large industrial energy users and to low voltage electricity distribution networks in each region, which deliver electricity to homes and businesses.

In Victoria, the best solar resources are not always located in close proximity to suitable network infrastructure, and existing network infrastructure can become constrained at specific locations within increasing connections and generation.

Proximity to the existing electricity network and spare connection capacity available at the anticipated connection point are highly important considerations for solar energy facilities.

The [Integrated System Plan](#), which the Australian Energy Market Operator (AEMO) released in July 2018, identified five Renewable Energy Zones in Victoria. The Zones are areas where clusters of large-scale renewable energy, including solar energy facilities, can be developed through coordinated investment in electricity transmission and generation. The five Zones identified highlight for renewable energy proponents where AEMO is proposing infrastructure planners prioritise their network upgrades, and a high-level timeline for their delivery, which may guide decisions about future project placement.

Further information on existing electricity network constraints can be identified using the [interactive maps](#) on the Australian Energy Market Operator (AEMO) website. Additional information is also available from the relevant electricity distribution business (Powercor and SP AusNet) planning reports.

4. Strategic site selection assessment criteria

4.1 Land use planning

In Victoria, local planning schemes have been prepared and adopted for each municipality that articulate state, regional and local policy directions for land use and development. The planning scheme outlines the strategic intent for the local government area and the criteria that planning permit applications will be assessed against.

Assessment of planning permit applications is usually carried out by the relevant local council in its capacity as the 'responsible authority' under the *Planning and Environment Act 1987*. In some instances, the Minister for Planning may be the relevant responsible authority.

Proponents should consider multiple site options within a region, as part of responding to state and local planning policy. These assessments will help determine if a site is suitable for establishing a solar energy facility, including the advantages of a site, any inherent constraints and challenges, and the relevant land use planning policies and provisions that apply. A proponent should try to avoid, mitigate or offset impacts on important environmental, cultural or landscape values

when selecting a site for a solar energy facility. Selecting a suitable site can help streamline the assessment process and result in a more timely decision.

The proponent is strongly encouraged to hold pre-application discussions with the relevant local government to understand key local values and strategic planning priorities.

Community input is a fundamental part of the Victorian Planning System. Stakeholder engagement from the outset of project planning is strongly recommended to assist implementation of solar energy facility projects and encourage long-term growth of the renewable energy sector. The Department of Environment, Land, Water and Planning (DELWP) guide *Community Engagement and Benefit Sharing in Renewable Energy Development* provides suitable advice.

Once a site has been selected, more detailed analysis is needed to confirm feasibility of the site and address approvals issues.

This checklist lists the site considerations that should be investigated at the regional level.

Strategic considerations

- Policy context, zones and overlays
- Agricultural values including irrigation infrastructure impacts
- Heritage and Aboriginal cultural values
- Landscape values and visual amenity
- Biodiversity and native vegetation
- Access to the Victorian electricity grid
- Other infrastructure requirements
- Cumulative effect of solar energy facilities in the area

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4.2 Planning policy, zones and overlays

The broad strategic intent for land use and development in each region of the state is set out in the relevant [regional growth plan](#). This information can be used to identify potentially suitable locations for solar energy facilities.

Applications for planning permits must be assessed against state and local planning policy set out in the VPP.

All land in Victoria is subject to a planning zone, which is defined in the VPP. Each zone establishes a range of potential land uses, which may be 'as-of-right' and do not require planning permission or require a permit or are prohibited. Multiple planning overlays may also apply to a potential development site, and these must be considered as part of the planning permit process. The zone and overlays ultimately determine whether a solar energy facility is allowable on a particular site in accordance with the Planning Policy Framework and may impose certain conditions on development.

Planning schemes do not apply to Commonwealth government land. Proponents seeking to develop a solar energy facility on Commonwealth land need to contact the relevant land manager of the 'Commonwealth place'.

Proponents are advised to obtain a planning [property report](#) for proposed sites as part of the selection process and consult the relevant council. This is an efficient way of finding out which planning provisions apply to a specific location.

Once a viable site has been selected, proponents should undertake a more detailed review of the planning controls, including the particular provisions of the VPP and any relevant planning policies and issues that need to be addressed as part of the permit application process.

4.3 Agricultural values

Victoria produces over 30 per cent of Australia's food, and accounts for about one-quarter of Australia's agricultural value.

The state produces a diverse range of produce including meat, grains, fruit, vegetables and dairy products.

Agricultural land, particularly irrigated land, is a valuable resource, and successive governments have invested heavily in improving agricultural production, including by modernising irrigation infrastructure.

In most rural areas, renewable energy generation, such as solar energy facilities, can effectively co-exist with agricultural production. Solar energy facilities can contribute to the rural economy and support farm incomes by providing property owners with a diversified revenue stream.

4.3.1 Planning strategies for protecting agricultural land

Strategies to protect agricultural land are set out in all Victorian planning schemes. Clause 14.01 Agriculture: Protection of agricultural land includes the objective to protect the state's agricultural base by preserving productive farmland. Key measures are outlined, including the need to:

- protect strategically important agricultural and primary production land from incompatible uses
- protect productive farmland that is of strategic significance in the local or regional context
- avoid permanent removal of productive agricultural land from the state's agricultural base without consideration of the economic importance of the land for the agricultural production and processing sectors.

The Farming Zone (Clause 35.07) sets out decision guidelines for 'Agricultural issues and the impacts from non-agriculture uses'.

Non-agricultural developments may be appropriate in the Farming Zone, and this clause outlines criteria for the council to consider when assessing a planning permit application.

Productive farmland that is of 'strategic significance' represents the most productive farming land in the state. This productivity arises from a combination of land attributes and economic factors, as set out in Table 1. Most rural land is not considered to be strategically significant agricultural land.

When making decisions on the appropriate location of solar energy facilities, councils should require permit applicants to provide an assessment of:

- the agricultural quality of the proposed site
- the amount of strategically significant agricultural land in the council area and in the region (the regional assessment should include impacts across the area defined by the Regional Growth Plan boundaries, unless otherwise determined by the council)
- the potential impact of removing this land from agricultural production.

The proponent should lodge a report on this assessment with the permit application. Table 1 provides information that these reports should contain. Strategically significant agricultural land may include other elements - these criteria have been adapted for use specifically in relation to solar energy facility development.

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Table 1 - ATTRIBUTES OF STRATEGICALLY SIGNIFICANT AGRICULTURAL LAND	
Land attributes	
Soils and landscape	<p>The following soil characteristics can be important to agricultural productivity depending on the locality:</p> <ul style="list-style-type: none"> • Inherent soil quality: soils that are high value due to their year-round and multi-purpose properties • Niche soil: soils that are particularly good for certain crops and support niche industries • Versatile soil: soils that assist in risk mitigation by being suitable for a range of cropping, horticulture and pasture purposes in industries that require different soil types
Water and climate	<p>Access to secure water supply and resilience to the impacts of climate change</p> <ul style="list-style-type: none"> • Access to modernised irrigation infrastructure: access to modernised irrigation delivery is a high priority for agricultural regions, including significant existing and planned areas requiring infrastructure investment by government and water authorities (See assessment criteria below) • Resilience and adaptability: resilience of land to the potential impacts of climate change, such as through access to a recycled water supply
Economic attributes	
Structural	<ul style="list-style-type: none"> • Favourable subdivision: a pattern of subdivision that favours sustainable agricultural production • Post-farm-gate processing and value adding: areas that support industries with critical links including processing plants and major packing houses • Industry clusters: areas where industries have successfully clustered to achieve significant efficiencies • Access: good access to existing markets, labour and transport, including airports and logistics facilities
Economic	<ul style="list-style-type: none"> • Government investment: areas of significant government investment targeted at food production and other agricultural economic development • Market trends: the potential for commercial agricultural growth based on commodity market trends

As well as following the guidance in Clauses 14.01-1 and 35.07 of the planning scheme, responsible authorities will also seek advice about the implications of specific solar energy facility proposals for management of the modernised irrigation grid from the relevant rural water corporation.

If it is determined as appropriate to develop a solar energy facility on strategically significant agricultural land, consideration should be given to:

- the opportunities and benefits from dual use or co-location, such as combining a solar energy facility with agricultural production

- how the facility could contribute to the agricultural economy by providing energy security or an alternative income stream
- how the facility could be decommissioned, and the land rehabilitated in the future to an agreed standard.

The weight that can be given to these factors will vary according to a site's particular environmental and economic conditions and the agricultural commodities it produces.

4.3.2 Assessment criteria for irrigated agricultural land

Areas serviced by modernised irrigation infrastructure are designated as strategically significant agricultural land (Table 1). Councils should give notice to rural water corporations under section 52 of the *Planning and Environment Act 1987* of planning applications for solar energy facilities in these locations.

Proponents should demonstrate that the development will have limited impacts on the significant investments that have been made by the Victorian and Commonwealth governments to upgrade irrigation infrastructure, supporting agricultural production in the region.

Advice from rural water corporations to the relevant council will focus on an assessment of whether the proposed development site is in an area serviced by modernised irrigation infrastructure and farmed using intensive irrigation.

The Government proposes to review the role of relevant rural water corporations in the planning permit application process, to provide them with a formal role as a referral authority for specific non-agricultural developments in areas serviced by the modernised irrigation grid. This change would require the responsible authority to seek advice from the relevant water corporation which would have a recommendatory role. It is proposed to give effect to this by amending the State planning policy to include reference to a map of the modernised irrigation grid, supported by planning provision changes, in order to guide proponents.

The policy would provide decision makers with clear assessment criteria for water corporations when providing their input to the Responsible Authority on relevant solar farm applications, such as the implications of the proposal on the irrigation system, its viability and sustainability. It is intended that all maps required to guide decision making will be prepared and updated by relevant water corporations to reflect ongoing adjustments to the irrigation system.

4.4 Heritage and Aboriginal cultural values

Solar energy facility developments may affect heritage assets both above and below ground. Impacts may be on the heritage site, its landscape setting or direct impacts on archaeological deposits through ground disturbance.

Proponents must check whether the proposed site for the solar energy facility is an area of heritage sensitivity and should avoid locations of high significance.

Proponents can use Aboriginal Victoria's [online map tool](#) and the [Victorian Heritage Register](#) to check whether the land is affected by a Heritage Overlay, or consult a suitably qualified heritage adviser.

Engaging with local Aboriginal groups beyond planning requirements, such as Cultural Heritage Management Plans, should also be a key consideration. Early dialogue with Traditional Owners and Aboriginal groups is important as part of identifying, verifying, managing or where necessary excluding areas of cultural heritage value from development (see section 5.3.5).

4.5 Landscape values and visual amenity impacts

The visual impact of a solar energy facility and the transmission lines connecting it to the grid should be considered at the pre-application stage. The most significant environmental effect of solar energy facility development can be its impact on landscape character and visual amenity, and it is vital that this be considered early in the planning process.

Ideal sites have:

- flat, low-lying topography that is not visible from surrounding areas
- appropriate setbacks from residential areas and other sensitive land uses
- the potential to be screened, such as areas with vegetation along the boundaries
- the potential for visual corridors to be maintained along key sightlines.

CST systems, which use reflecting mirrors, require more extensive landscape impact and visual amenity analysis.

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4.6 Biodiversity and native vegetation

Proponents must consider how the proposed development would affect local biodiversity and native vegetation, and the impact on any species listed under the [Flora and Fauna Guarantee Act 1988](#) and the [Commonwealth Environment Protection and Biodiversity Conservation Act 1999](#).

Planning provisions for protection, management and removal of native vegetation are set out under [Clause 52.17 Native vegetation](#) in the VPP.

Planning permit applications must include an assessment of flora impacts.

All developments must avoid the removal of native vegetation, or minimise impacts where removal cannot be avoided, before considering mitigation by offsetting residual impacts. The overall requirement is to ensure that there is no net loss to biodiversity because of the removal, destruction or lopping of native vegetation.

One option to avoid or minimise impacts on native flora and fauna is to choose a site for a solar facility that has previously been cleared for other land uses.

4.7 Electricity grid connection and transmission and distribution Infrastructure

Any electricity generation facility anticipating connection to the NEM (including solar energy facilities) will be required to submit a grid connection application in accordance with the National Electricity Rules. In Victoria, transmission level (large scale) connection applications are administered by the Australian Energy Market Operator (AEMO) while smaller scale (typically below 10 MW) connections are administered by the local electricity business. To find more information about Victoria's electricity network, consult the AEMO brochure on [Electricity infrastructure in your community](#). A developer of a solar energy facility will be required to identify a point of connection if connecting to the NEM.

Construction of distribution and/or transmission lines and substations can create significant change across the landscape of an area. Communities can be concerned about unwanted impacts on visual amenity related to the route, pole placement and appearance; as well as changes to road use or traffic conditions.

Comprehensive consultation ensures all the relevant stakeholders are engaged through the planning and construction stages of the project. All affected landholders, communities, councils and relevant authorities should be fully aware of works – including design, placement and appearance – before they commence. This includes any landowners and occupiers adjacent to road reserves.

It is also important to hold discussions with the relevant electricity authority to determine what connections are necessary for the project and their possible impact on the local area. This consultation should occur early in the development process and should factor in network connection route and options and the extent of roadside or other public land proposed to be utilised compared to private land. Any works on public land will require the approval of the public land manager. This may

be the local council or the Victorian Government through DELWP. In terms of siting power line infrastructure on road reserves or Crown land, it is the responsibility of the developer to ensure that all relevant approvals are in place for any given project. Relevant authorities are identified below:

- **Local roads:** Local councils are typically the relevant authority that manages local roads. Approval will be required from the council as the road manager for any works within the road reserve. DELWP generally administers roads that are unused and occupied by the adjoining owner. Note that councils and their constituents will be concerned with the final design and placement, as well as appearance, of power lines. It is recommended that as much information is shared with councils as possible throughout the design phase to maximise social acceptance.
- **State roads (VicRoads):** Approval will be required from VicRoads as the road manager for any works within the road reserve. Further information is contained within relevant VicRoads guidelines listed at the end of this document. It is recommended that design and placement information is also shared with councils to maximise local understanding and acceptance.
- **Crown land:** Any works on public land will require the approval of the public land manager. This may be the local council or the Victorian Government through DELWP or Parks Victoria.

Public land managed as parks, for conservation or related public purposes should be avoided where practicable. Works on Crown land also may require consultation around matters pertaining to the [Native Title Act 1993](#) (Commonwealth) and [Traditional Owner Settlement Act, 2010](#). This legislation is administered in Victoria by DELWP. Additional considerations also apply to Crown land under the [Fauna and Flora Guarantee Act, 1988](#) and the [National Parks Act, 1975](#).

4.8 Cumulative effect of solar energy facilities in an area

Clustering of a solar energy facility with other solar energy facilities or other renewable energy facilities in an area can provide efficiencies in facilities sharing existing or augmented grid network infrastructure, but may also have cumulative effects, such as visual impacts.

When assessing a potential site and preparing a description of it as part of a planning permit application, proponents should list other significant infrastructure in the vicinity.

Proponents should consider the cumulative impact of the proposed facility with other nearby development, and the potential effects on the community or locality. Proponents are also required to consider cumulative impacts on biodiversity under [Clause 12.01 Biodiversity](#) in the VPP.

Cumulative impacts, as defined in the [Ministerial Guidelines for assessment of environmental effects under the Environmental Effects Act, 1978](#), occur where a project, in combination with one or more other proposed projects, or existing activities in an area, has an overall significant effect on a particular environmental asset.

A regional perspective is also needed on the potential effects of a project to provide a wider context for assessing potential impacts on biodiversity, landscape and agricultural values, such as the impact of several solar energy facilities along the same upgraded irrigation channel.

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5. Detailed development assessment

The local council is the responsible authority under *The Planning and Environment Act 1987* for assessing planning permit applications for solar energy facilities¹. The council will consider state planning policies, the applicable zone and overlays that apply, the relevant particular provisions and local planning policies or other guidance provided within the planning scheme when assessing an application.

The council will assess the planning permit application and any other associated approvals. The reconfiguration of lot boundaries and operational works permits for earthworks, roadworks and other civil engineering activities all require approvals.

The planning scheme may also require the application to be referred to DELWP or other referral authorities. Referral authorities will assess the application and provide comments to the council to inform its decision making.

All permit applicants are encouraged to engage an experienced planning consultant to help prepare, lodge and navigate the planning permit application through the process. This approach is generally the most efficient option and will save applicants time and resources over the whole development application process.

5.1 Application requirements

The relevant particular provision for solar energy facility developments in the VPP is [Clause 53.13 Renewable energy facility \(other than wind energy facility and geothermal energy extraction\)](#). It applies to any building or other structure or thing used in or in connection with the generation of energy by a renewable resource. It does not include a renewable energy facility principally used to supply energy for an existing use of the land.

This clause sets out the application requirements for proponents and the decision guidelines for the responsible authority to consider in their assessment of a planning permit application for a solar energy facility.

To successfully apply for a planning permit to construct and operate a solar energy facility, proponents should complete the following steps.

5.1.1 Pre-application discussions

Proponents should discuss the following matters with the responsible authority (e.g. local council or Minister):

- the relevant state and local planning policies, guidelines and other planning scheme requirements that apply to the proposal
- the requirements of any referral authorities or other agencies that may have an interest in the proposal, or where other consents are required (such as AEMO or the relevant Distribution Network Service Provider)
- other parties and stakeholders who may be affected by the proposal and the potential actions that might need to be taken to address any issues that are likely to be raised in the assessment process.

The DELWP guide [Community Engagement and Benefit Sharing in Renewable Energy Development](#) contains more information about pre-application discussions.

¹ The Minister for Planning can 'call in' any planning permit application in Victoria under section 97 of the Act.

5.1.2 Lodgment and processing of planning permit applications

The information that proponents need to provide will vary depending on the context of the proposal and the requirements of any referral authorities (Pre-application discussions with the responsible authority will help refine what is most relevant).

When all the relevant information has been received and is determined to be satisfactory, the responsible authority will proceed with public notice and referral of the application. Upon completion of notice and referral processes, the council will determine the application.

The relevant assessments for this information are discussed in the following sections.

5.2 Permit application documentation

All assessments and documentation submitted with the application should clearly state the facts, the scope of the matters and all assumptions on which the assessments were based.

Permit applications must include:

- a signed application form
- payment of the relevant fee
- a current copy of title for the subject land
- a site and context analysis, including the relevant land use zone, overlays and
- consideration of any applicable particular provisions in the planning scheme
- a design response, as described in Clause 53.13 of the VPP.

5.2.1 Site and context analysis

The site and context analysis should reflect the process of site selection (as outlined in section 4) and feasibility analysis.

The site analysis should:

- demonstrate consideration of the site selection criteria discussed in these guidelines
- list any significant constraints of the site and surrounding area
- demonstrate consideration of how the development may be affected by these characteristics.

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5.2.2 Design response

The design response must include:

- detailed plans of the proposed development (see below)
- accurate visual simulations illustrating the development in the context of the surrounding area and from key public viewpoints
- an assessment of the extent of vegetation removal and a rehabilitation plan for the site
- a written report with comprehensive information about the proposal (see below).

The detailed plans should cover:

- information on the layout and dimensions of the facility and any associated building and works
- relevant design elements
- the reflectivity of the facility
- the electricity distribution point (where the electricity will enter the distribution system)
- site access points
- vehicle access to roads and parking areas
- a description of any drainage system for the site.

The written report should include:

- an explanation of how the proposed design responds to the site analysis
- a description of the proposal, including the types of processes that will be utilised,
- materials to be stored, and the nature of any onsite treatment of waste
- whether a works approval or licence is required from EPA Victoria
- the potential amenity impacts such as noise, glint, light spill, emissions to air, land or water, vibration, smell and electromagnetic interference (see Best Practice section)

- the effect of traffic to be generated on roads, including a traffic management plan
- a strategic assessment of the impact upon Aboriginal or non-Aboriginal cultural heritage
- a strategic assessment of the impact of the proposal on any species listed under the *Flora and Fauna Guarantee Act 1988* or the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (where relevant)
- an environmental management plan including a construction management plan, and information on any proposed site rehabilitation and monitoring (see Best Practice section)
- the design of any associated electricity transmission or distribution infrastructure, including pole design, route options, road safety considerations, visual amenity impacts, setbacks from sensitive land uses and the relationship to existing infrastructure
- a statement of why the site is suitable for a renewable energy facility (see below).

The statement about site suitability should cover:

- the agricultural quality of the site
- a calculation of the estimated reduction in greenhouse gas emissions due to the facility's production of emissions-free energy
- the amount of strategically significant agricultural land in the council area and the region
- the impact of removing this land from agricultural production.

5.2.3 Access and traffic management

Proponents should provide a traffic management plan to the responsible authority that details how the proposed solar energy facility will affect local traffic flows and road conditions in the surrounding area.

The permit application must include an analysis of site access and transport management for all stages of the project, including design, construction, operation and decommissioning.

Before construction begins, permit conditions will require a proponent to conduct an existing conditions survey of public roads for use during the construction and operation of the facility and provide a copy to the council.

The conditions survey should:

- be prepared by a suitably qualified and experienced independent civil or traffic engineer
- be prepared in line with the requirements of the relevant road management authority
- assess the suitability, design, condition and construction standard of the relevant public roads and access points including recommendations regarding any required upgrades to accommodate construction traffic.

The Best Practice section has more information on addressing traffic impacts.

5.3 Other approvals

Proponents are responsible for contacting relevant agencies to determine which approvals are required for their developments.

[Clause 53.13](#) of the VPP sets out the assessments that proponents may need to conduct to satisfy the requirements of other state legislation and referral authorities.

The approvals required will vary depending on the context of the proposal, the controls affecting the site, and the requirements of any referral authorities.

5.3.1 Native vegetation

Proponents need to assess whether any native vegetation removal, destruction or lopping is needed during development and construction, including for preparatory works and works on road reserves.

Proponents must consider the [DELWP Guidelines for the removal, destruction or lopping of native vegetation](#) and whether any vegetation offsets are necessary. The [DELWP Assessor's Handbook: Applications to remove, destroy or lop native vegetation](#) provides more information about offset reconciliation. The [Biodiversity information and site assessment](#) page on the DELWP website provides an up-to-date list of accredited native vegetation assessors.

A permit is required to remove any native vegetation, and the impacts must be assessed in accordance with Clauses 52.16 or 52.17 and [Clause 53.13](#) of the local planning scheme. Proponents must also account for loss of vegetation due to the creation of site access routes and shading from solar panels.

Proponents should ensure that they deal with all native vegetation removal requirements at the beginning of the planning permit application process. Projects can be delayed if proponents need to reapply later for additional vegetation removal permissions.

Department of Environment, Land, Water and Planning

5.3.2 Flora and fauna

In Victoria, the *Flora and Fauna Guarantee Act 1988* is the key piece of Victorian legislation for the conservation of threatened species and communities and for the management of potentially threatening processes. All native wildlife is protected in Victoria. It is an offence to kill, take, control or harm wildlife under the *Wildlife Act 1975*. A permit may also be required to remove protected vegetation under the *Flora and Fauna Guarantee Act 1988* if it is part of the declared critical habitat of that flora (section 20). Matters listed under the *Flora and Fauna Guarantee Act* can also form the basis for referral to the Minister for a decision about the need for an Environmental Effects Statement (EES).

Proponents must also consider the impact of their proposal on any species listed under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999*.

5.3.3 Environmental effects assessment: Victorian processes

Assessment of the potential environmental impacts or effects of a proposed development may be required under the *Environment Effects Act 1978*.

The Minister for Planning is responsible for administering the *Environment Effects Act* and for deciding whether an EES is required under the Act. If a proposal is likely to have a significant effect on the environment, the onus is on the proponent to refer it to the Minister for a decision on the need for an EES.

Matters listed under the *Flora and Fauna Guarantee Act* can form the basis for referral to the Minister for a decision about the need for an EES. Where it is reasonably likely that species listed under the *Flora and Fauna Guarantee Act* will be affected by a development, proponents may be required to conduct surveys before applying for a planning permit. Potential impacts on flora and fauna should be considered early in the planning process to enable impacts to be avoided, or at least minimised, where practicable.

If an EES is required, the preparation of a *Cultural Heritage Management Plan* (CHMP) becomes mandatory under the provisions of the *Aboriginal Heritage Act 2006*. See the [EES Advisory Note: Aboriginal Cultural Heritage](#) for more information about preparing a CHMP.

The *Ministerial Guidelines for assessment of Environmental Effects under the Environment Effects Act 1978* provide guidance on EES processes.

If an EES is required for a solar energy facility, this process must be completed before the planning permit application can be determined. In some cases, an EES may not be required, but specific conditions may need to be met as an outcome of the Minister's determination.

5.3.4 Commonwealth environmental effects assessment processes

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* protects Matters of National Environmental Significance, including threatened flora and fauna, or migratory species. For guidance on impacts on Matters of National Environmental Significance that would trigger a referral under the Environment Protection and Biodiversity Conservation Act, see the Commonwealth Government's [Department of Environment and Energy](#) website.

Proponents should contact the council, the local DELWP Natural Environments Program officer and the Commonwealth Department of the Environment and Energy about whether the proposed large-scale solar energy facility may affect species protected under the *Environment Protection and Biodiversity Conservation Act*.

A bilateral agreement is in place between the Victorian and Commonwealth governments to avoid duplication of assessment processes by allowing Victoria to assess proposals likely to have a significant impact on environmental significance that the Commonwealth has determined to be 'controlled actions'. More information is available at: planning.vic.gov.au/environment-assessment/environmental-assessment-bilateral-agreement.

5.3.5 Heritage and cultural heritage

Land used to generate electricity is defined as a high-impact activity under Division 5 of the *Aboriginal Heritage Regulations 2007*. If the solar energy facility is in an area of cultural heritage sensitivity, a [Cultural Heritage Management Plan](#) (CHMP) will be required under the Regulations. A heritage adviser is required to prepare the CHMP on behalf of the proponent.

A CHMP is mandatory if the project:

- requires an EES under the *Environment Effects Act*
- is in an area of cultural heritage sensitivity that has not previously had significant ground disturbance.

Proponents may elect to voluntarily prepare a CHMP to proactively manage any potential social or cultural risks of the project for Aboriginal Heritage. The CHMP will then need to be approved by the relevant Registered Aboriginal Party for the area. The aim is to protect and preserve cultural heritage places, and to identify opportunities to introduce better management of affected assets and designated sites.

The council and permit applicant must also consider [Clause 15.03-2S Aboriginal cultural heritage](#) in the PPF, which sets out the Victorian Government's policy for the protection and conservation of places of Aboriginal cultural heritage significance.

Where solar energy facilities are located on Crown land, a range of legal requirements, including the provisions of the *Commonwealth Native Title Act 1993*, may apply.

The DELWP Planning Practice Note [The Aboriginal Heritage Act 2006 and the Planning Permit Process](#) provides guidance and assistance. Proponents can also contact [Aboriginal Victoria](#) and the [Heritage Council of Victoria](#) for more information.

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5.3.6 Fire Management

The CFA's involvement may be triggered by referral from the council under Section 55 or Section 52 of the *Planning and Environment Act 1987*. In this case, the CFA may provide permit approval conditions.

Crown land

Where a solar energy facility proposal is located on, or adjacent to Crown land, DELWP must be notified for the purposes of bushfire management.

5.3.7 Infrastructure connections and licences

Proponents must demonstrate to the council that their selected site has adequate road access and utility connections necessary for construction and ongoing operations. Some infrastructure connections require licences from relevant authorities.

Infrastructure connections include:

- [electricity grid connection and licences](#)
- AEMO connection agreement
- gas supply
- water supply.

Online electricity network mapping resources and links:

1. Australian Renewable Energy Mapping infrastructure (AREMI) maps that provide renewable energy resources info, infrastructure (distribution and transmission, Network opportunities:
<http://nationalmap.gov.au/renewables/>
2. AEMO:
<http://www.aemo.com.au/aemo/apps/visualisations/map.html>
- Powercor Sub-transmission Generation capacity map:
<https://www.powercor.com.au/our-services/electricity-connections/solar-and-other-generation/connecting-larger-embedded-generator-systems/>

5.3.8 Additional infrastructure plans

Proponents should also prepare a concept plan for any new infrastructure they wish to construct, including associated transmission infrastructure, electricity utility works and access road options.

Proponents may investigate and discuss with the council opportunities to develop shared infrastructure, including transmission lines, where possible, to reduce costs and visual amenity impacts.

This plan should include:

- proposed siting and design responses
- pole design and placement for transmission lines
- route options for transmission lines and access roads
- road safety considerations for transmission lines
- landscape and visual amenity impacts
- setback distances from residences
- options to use existing infrastructure
- options for sharing of distribution lines between different generators.

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Best Practice Guidance for Proponents

This section outlines a general best practice approach for proponents to apply in the process of developing a solar energy facility.

Proponents are strongly encouraged to use these ideas to improve the quality of their development proposal and minimise impacts on neighbouring properties during construction. Proponents are also encouraged to use specialist advisers, such as planners and ecologists, throughout the design and development of the solar energy facility to ensure that adverse impacts are mitigated, and benefits are maximised.

Following these guidelines is recommended, not mandatory, and other approaches may also qualify as best practice.

Department of Environment, Land, Water and Planning

6. Community engagement and stakeholder consultation

To balance goals of community wellbeing with individual project development and long-term growth of the renewable energy sector, stakeholder engagement from the outset of project planning is strongly recommended.

Best practice community engagement will help build a positive profile for the project, which in turn will help maximise job, investment and energy sector growth opportunities in regional Victoria.

The Victorian Government has developed a [Community Engagement and Benefit Sharing in Renewable Energy Development](#) guide for renewable energy developers seeking support under the VRET and other programs. It provides best practice, up-to-date guidance on

community engagement and approaches to the shared benefits of large-scale renewable energy projects, including solar energy facilities.

Pre-application consultation is not a formal statutory requirement of the planning permit process. However, if it is done effectively, this work offers benefits for proponents and interested parties alike.

After a proponent lodges a planning permit application, there are statutory requirements to notify the public of the proposal.

Once a site has been selected, proponents should conduct detailed consultation with relevant stakeholders.

STAKEHOLDERS	
Community	The 'community' refers to all the people who live within, and identify with, the geographic area surrounding the proposed site of the renewable energy project. The developer should engage the community at the pre-design stage, through local exhibitions and presentations where community views can be sought and recorded.
Relevant agencies	Agencies with responsibility for emergency management, catchment protection and environmental protection, such as DELWP, the Country Fire Authority, catchment management authorities, rural water corporations and the Environment Protection Authority.
Landowners and land users	This group includes stakeholders and decision makers such as farmers and Traditional Owners. It is critical to engage early with landowners and land users to understand their current use of the land and discuss their interest in hosting solar projects on their land. Neighbouring landowners should also be actively involved in the process.
Stakeholders involved in prospective resource developments	Owners of mining leases, petroleum production and exploration licences should be consulted. These titles do not prevent development on the land they apply to, but it is important to consult with title holders and to determine the terms of any required access arrangements.

6.1 Engagement plans

The development of a well-planned communications and consultation plan will help drive an effective and efficient engagement program. Effective engagement not only informs communities of project information, decisions and actions, but also involves them in the process.

The engagement process and associated plan should be clear, transparent and tailored to the site context. It should also provide methods for monitoring and opportunities for the community to give feedback to help inform the planning process. This plan should cover the entire project lifecycle, from site selection to decommissioning.

6.2 Benefit sharing

A benefit-sharing program is a plan to strategically deliver added value to the local region over the lifecycle of a project. Proponents who take the time to consider how their development could benefit the local community are more likely to be well received by community and other key stakeholders.

Proponents can demonstrate commitment to community wellbeing by conducting social sustainability activities or by contributing to the local economy through a local industry participation plan.

The proponent may also consider community engagement plans provided by local government authorities where relevant.

6.3 Ongoing engagement

Once a solar energy facility is built, it will become part of the social context of the area. Following construction, solar energy facility operators should shift their engagement focus to maintaining positive, mutually beneficial relationships with the community.

During the decommissioning process, the community should be engaged as part of any plans to rehabilitate the land or to refurbish and upgrade a solar energy facility to extend its operational lifespan.



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7. Design stage

7.1 Landscape values and visual amenity

Using best practice design will help minimise impacts on visual amenity for surrounding land users.

Proponents should consider:

- screening the site using vegetation or other barriers (see below)
- implementing methods to reduce the impact of glint, glare and light spill, such as screening and panel row orientation (see below)
- designing fencing and other security measures to reduce impacts on surrounding land use
- designing the height, siting and layout of panel arrays and related infrastructure to minimise visibility from surrounding view points
- choosing materials with colours and textures that provide minimal contrast with the landscape
- using the topography of the site and the surrounding landforms to reduce visibility.

7.1.1 Screening

Proponents should construct screening where necessary to limit the potential visual amenity impacts of solar energy facilities.

Although it may be possible to use the topography of the site to assist in screening, use of vegetation buffers is the most common screening method.

It is important that established vegetation and mature trees are retained as much as possible for screening. Where existing vegetation cannot be used, native vegetation should be planted. Vegetation should be of sufficient height and width when mature to screen the panels and ancillary infrastructure from surrounding sensitive land uses and minimise glare from panels for road users.

Screening should be located on the proponent's land, except where arrangements have been secured with the relevant adjacent landowners.

A project landscape plan should be prepared that may include:

- use of locally indigenous native plants
- planting of vegetation early in the construction process and plans for regular maintenance
- use of retained topsoil where reasonable and feasible to create elevated planting beds to assist with screening
- careful consideration of shading to panels that may result from improper siting of vegetation.

7.1.2 Glint, glare and light spill management

Some stakeholders may be concerned about the impact of glint and glare from solar energy facilities on their visual amenity. Glint may be produced as a direct reflection of the sun from the surface of the solar panel, whereas glare is a continuous source of brightness, relative to ambient light. Glare is significantly less intense than glint. Lighting, including security lighting, may also impact surrounding residents, roads and nocturnal animals, such as bats, if improperly managed.

Proponents should carry out a glint and glare assessment of the solar energy facility to understand these issues. The council may also seek advice from VicRoads where solar energy facilities are located along or facing roads and could pose a risk to road safety. Modelling can be used to assess the level of reflection to guide mitigation strategies and appropriate site management responses.

CST systems are likely to have increased levels of glare compared to solar PV arrays, and CST infrastructure may require larger setbacks from other sensitive land uses.

Proponents should clearly set out information about glare in the planning permit application and consider it in any landscape impact assessment.

A glint, glare and light spill management plan should be prepared and lodged with the permit application.

The plan should include:

- use of anti-reflective solar panel coatings and non-reflective frames
- adjustment of panel orientation relative to glare risks, such as oncoming traffic travelling on a road descending from an elevated area
- strategically located screening that considers topography and surrounding land uses, including possible off-site plantings, by agreement with the relevant landowners
- careful consideration of the height, orientation and design of lighting.

7.1.3 Design of security measures

Along with minimising the visual impacts of solar panels on the landscape, proponents should also reduce the visual impacts of security measures as much as possible and minimise the impact on flora and fauna.

Proponents are encouraged to submit plans with full details and specifications of all security and lighting installations with their application.

When planning security measures, proponents should:

- carefully consider the height, design and materials used for security fencing
- consider the orientation of lighting relevant to sensitive uses and vegetated areas to reduce impacts on people and wildlife
- use features such as topography, landscaping or vegetation to screen security fencing and lighting
- ensure appropriate access is provided for fire suppression, based on advice from the Country Fire Authority.

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7.2 Potential off-site impacts

7.2.1 Noise

Solar energy facilities produce little noise. However, some communities are concerned that potential noise emissions may impact their amenity and wildlife.

Proponents should follow the EPA Victoria guidelines [Noise from industry in regional Victoria](#) and include a predictive noise assessment with their permit application.

Noise impacts should be managed by:

- introducing measures such as acoustic housing of the noise source, such as around a noisy motor
- documenting potential noise sources from solar energy facility equipment
- limiting noisy operations to the day time.

7.2.2 Electromagnetic radiation and interference

Electrical equipment produces electromagnetic fields. This electromagnetic radiation produced from transformers and inverters is reduced through performance standards that apply to standard components.

The [Australian Radiation Protection and Nuclear Safety Agency \(ARPANSA\)](#), advise that the strength of these fields will decrease with distance from the source and become indistinguishable from background radiation within 50 metres for high-voltage power lines and within 5 to 10 metres of substations. Design and layout of the facility should account for these factors.

7.2.3 Heat

Some stakeholders may be concerned about potential 'heat island effects' in relation to solar energy facilities.

A heat island occurs where ambient temperatures around developments are higher than those of surrounding vegetated areas, particularly at night. This is similar to the urban heat island effect.

However, while the heat island effect is known to exist in large urban areas, there is little evidence of impacts on other land uses such as orchards due to heat dispersal from solar energy facilities.

7.3 Co-location and dual use with agriculture

Co-location of solar energy facilities with other rural land uses presents an opportunity to increase the productivity of a site by using it for more than one purpose, such as siting solar arrays on less productive parts of a property.

Dual-use, also referred to as 'agrophotovoltaics', is in-situ agricultural production including sheep grazing between panels or cropping under elevated arrays.

When managed appropriately, sites can share land between solar energy generation, some agricultural purposes or even biodiversity conservation activities.

See Appendix C for more information.

7.4 Biodiversity

Solar energy facilities may affect the biodiversity of the area around a site. Careful assessment of impacts on biodiversity is particularly critical for sites of high biodiversity value.

Proponents should conduct an ecological impact assessment to inform the design and management of their facility. Proposals for CST facilities should include strategies to mitigate the particular impacts of this technology.

Proponents also need to consider how wildlife will affect the infrastructure and operation of the site during the design and development of solar energy facilities.

If a wildlife management plan is required, it should set out how the operators will mitigate the impact from wildlife such as cockatoos and kangaroos. The DELWP [Guidelines for Reducing Cockatoo Damage](#) is a useful resource.

The plan should incorporate agreed strategies for working with adjoining landowners to minimise the availability of food that would attract the wildlife to the area, consistent with the DELWP [Living with Wildlife Action Plan](#).



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8. Construction stage

The construction stage of the development is likely to have the greatest impact on both surrounding residents and wildlife.

To maintain good relations with stakeholders, it is important for proponents to implement management strategies identified in the design stage and adopt best practice methods during the construction of solar energy facilities. For best practice guidelines on general construction, proponents should consult the [EPA Victoria Environmental Guidelines for Major Construction Sites](#).

8.1 Planning for future agricultural use

When solar energy facilities are constructed on viable agricultural land, it is important to plan for the future return of the land to a similar or improved quality and capability.

Proponents should consider protection of topsoil and avoiding soil compaction and damage to land drainage by using low ground pressure tyres, tracked vehicles and other equipment.

If the responsible authority permits the stripping of topsoil and subsoil from affected areas, it should be stored on site for replacement following the completion of construction works or the decommissioning of the facility.

Good practice at the construction stage will yield long-term benefits for site productivity and optimal grazing conditions for co-located agricultural uses.

8.2 Site access

During construction, site access should:

- strictly follow the endorsed traffic management plan
- implement noise management measures
- comply with flood management strategies, such as controlling run-off by not disrupting drainage along access tracks, in line with any flood risk assessment.

The council may require a construction management plan, including a complaint register and response system, as condition of the planning permit.

Proponents are encouraged to use local contractors and suppliers in their construction process as part of a benefit-sharing scheme.

8.3 Dust management

Large projects that remove vegetation and reshape topography can create extensive land disturbance, making soil vulnerable to erosion. Soil removed by erosion may become airborne as dust or be carried into waterways causing pollution.

Measures to address the creation of dust and sediment from land disturbance should be included in the planning and design phase of the project before any land is cleared.

8.4 Construction noise management

Construction noise should be managed in accordance with [EPA Victoria Guidelines](#).

To address impacts on nearby sensitive land uses, proponents should reduce potential noise from vehicles servicing the site, fixed machinery within the site and during construction activities. This may be done by limiting times where noisy operations are allowed and engaging with stakeholders to address any potential impacts.

9. Operations stage

A solar energy facility is expected to operate for at least 20 to 30 years. Solar energy facilities can be operated from the site or from another location. Although solar energy facilities generally require less maintenance than other energy production facilities, proponents will still need to develop plans for monitoring and maintenance and managing ongoing issues. An effective maintenance regime will optimise energy yield and maximise the operational life of the facility. The maintenance regime should respond to the local context and conditions.

9.1 Fire risk

Proponents should monitor and maintain their facility to reduce fire risk resulting from faults, unsafe construction practices and other factors. Proponents should work with the Country Fire Authority and/or DELWP to develop effective fire-prevention measures and clear response protocols for the site and adjacent land, including in the event of fire fighters needing to access and safely operate on the site.

Proponents can also reduce bushfire risk by practising effective vegetation management, particularly during the bushfire season, using techniques including mowing, spraying and mulching. On larger sites, where these techniques may be impractical, the introduction of grazing animals may be a useful solution.

An operations management plan should include:

- maintenance of solar panels and ancillary infrastructure
- maintenance of vegetation
- waste management
- ongoing management of fire risk (see below)
- safety, emergency and contamination management (see below)
- a complaint and incident management plan to respond to any incidents or on-site accidents.

9.2 On-site safety and contamination management

Safety measures for the operation of solar energy facilities should include appropriate training for staff in all aspects of on-site safety, contamination and hazard management and emergency protocols for responding to spills, leaks and breakages, including solar panel or storage battery (if relevant) damage.

Identification and management of risks and hazards should be compliant with best practice standards ISO 31000 'Risk management' and ISO 45001 'Occupational health and safety'.

Management of chemical risk issues must follow WorkSafe Victoria guidelines.

A site hazardous incident response plan should include measures for:

- immediate clean up procedures
- waste containment
- safe transport and disposal
- incident notification to appropriate authorities.

9.3 Off-site impact management

Proponents must provide ongoing management of amenity impacts throughout the life of the solar energy facility.

All potential off-site impacts identified in the design phase, including impacts on visual amenity, glint, glare, noise and heat, must be actively managed and mitigated, and documented in the operations management plan.

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10. Decommissioning stage

The operational lifespan of a solar energy facility typically ranges from 20 to 30 years, depending on the environmental conditions of the site, the level of maintenance, the type of technology used and any maximum timeframe for the use specified under an approved planning permit.

The operational lifespan represents the period of time where it is more cost-effective to maintain the solar panels rather than remove or replace them. After this time, some facilities will be decommissioned or may be reconditioned if deemed appropriate.

Decommissioning is an important step in the life of a solar energy facility. Although best practice facilities have minimal environmental impact, decommissioning a facility requires care to ensure the land is returned to its original condition for agriculture or other uses.

Proponents should prepare a decommissioning and rehabilitation plan specifying:

- the party responsible for the decommissioning
- the condition and terms of equipment removal, including disassembly and safe removal of components such as solar arrays and supporting infrastructure such as transmission lines, electricity substations, switchyard and overhead transmission lines
- requirements for restoration of the land, including revegetation and rehabilitation of the land to its pre-development condition, including irrigation layout and soil profile
- a timeline for the decommissioning work.

This plan should be periodically updated in consultation with the council and the property owner if the site is leased.

The proponent must comply with the relevant construction environmental conditions when undertaking the decommissioning of the solar project.

There may also be scope to leave some infrastructure in place, such as access tracks through the site, if the landowner or other stakeholders would like to retain it.

10.1 Recycling equipment

Solar panels are made of mostly recyclable materials, including glass and aluminium, making it feasible to recover and reuse these materials at the end of the panels' useful life.

Proponents are encouraged to recycle materials where possible.

Appendices



Department of Environment, Land, Water and Planning

A. Useful contacts

Organisation	Key contact	Notes	Contact details
Aboriginal Victoria		For information on Cultural Heritage Management Plans	1800 762 003
Australian Energy Market Operator (AEMO)		For enquiries about connecting to the Victorian transmission network	1300 226 600 connections@aemo.com.au Visit their website
Commonwealth Department of the Environment and Energy	Environment Assessment Branch	To organise a pre-referral meeting for <i>Environment Protection and Biodiversity Conservation Act 1999</i> and Matters of National Environmental Significance matters	epbc.referrals@environment.gov.au Visit their website
Country Fire Authority (CFA)		For more information on fire risk and management	Visit the CFA website to find the contact details for the relevant district
Catchment management authorities		For more information on flood risk and management	Visit the DELWP Catchment Management Framework website to find contact details for the relevant CMA
Department of Environment, Land, Water and Planning (DELWP)	Business and Energy Sector Development	For new energy projects and investment advice, including domestic business engagement and supply chain activation	136 166
	Impact Assessment Unit	For information on <i>Environment Effects Act 1978</i> matters	(03) 8392 5503 environment.assessment@delwp.vic.gov.au
	Planning approvals for native vegetation referrals	To contact a local planning approvals officer	Barwon South West: (03) 5226 4667 30-38 Little Malop Street, Geelong 3220 Gippsland: (03) 5172 2111 71 Hotham Street, Traralgon 3644 Grampians: (03) 8336 8856 402 Mair Street, Ballarat 3350 Hume: (03) 5761 1611 89 Sydney Road, Benalla 3672 Loddon Mallee: (03) 5430 4444 1-7 Taylor Street, Epsom 3551 Port Phillip: (03) 9210 9222 609 Burwood Highway, Knoxfield 3180
	Natural Environments Program	For environmental survey advice	An up-to-date version of the Native vegetation credit register service providers can be found on the DELWP Environment website , by navigating to Native Vegetation > Native Vegetation Offsets
Department of Economic Development, Jobs, Transport and Resources	Invest Assist	For foreign investors seeking new energy project and investment advice	(03) 9551 8100 Visit their website
Environment Protection Authority (EPA)		For enquiries about works approvals or licences	1300 372 842 contact@epa.vic.gov.au
Heritage Council of Victoria		For enquiries about Victorian heritage	(03) 9551 5060 heritage.council@delwp.vic.gov.au
Local government authority (council)	Statutory planning officer		
	Economic development officer		To find contact details for your relevant council, visit the Know Your Council website
	Road engineer		
VicRoads		To engage with VicRoads as a referral authority	13 11 71

B. Planning permit application checklists for solar energy facilities

Applications for planning permits for solar power facilities are assessed under Clause 53.13 Renewable Energy Facility (other than Wind Energy Facility and Geothermal Energy Extraction).

The purpose of this clause is to facilitate the establishment and expansion of renewable energy facilities, including solar power facilities, in appropriate locations, with minimal adverse impacts on the environment and local amenity.

Proponents must include the following information as part of their planning permit application for a solar energy facility.

Site and Context Analysis

- Relevant state policy directions, including an assessment of the agricultural quality of the site, the amount of quality agricultural land in the council area and the region and the impact of removing this land from agricultural production.
- Applicable regional and local planning policy.
- Existing land uses in the site context, including agricultural uses and other solar energy facilities.
- Geographical features and landscape values of the site context.
- Heritage and Aboriginal cultural values.
- Biodiversity and native vegetation.
- Electricity grid access, including power line route

Design response

Detailed plans of the proposed development, comprising:

- layout and dimensions of the facility and any associated buildings and works
- relevant design elements
- reflectivity assessment of the facility
- landscape assessment, including an assessment of the impact of the proposal on significant views, including visual corridors and sightlines
- accurate visual simulations illustrating the development in the context of the surrounding area and from key public viewpoints
- proposed connections to the electricity grid (the on-site metered point of output from the converter station where the generated electricity units will enter the distribution system)
- a concept plan that includes the capacity of new grid connections, network transmission infrastructure, electricity utility works and access road options
- site access, vehicle access to roads and parking areas
- the nature of any drainage systems for the site
- an assessment of the extent of vegetation removal and a rehabilitation plan for the site, as specified in the *DELWP Guidelines for the removal, destruction or lopping of native vegetation*.

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Technical analysis

- An explanation of how the proposed design response derives from and responds to the site analysis.
- A description of the proposal as specified in Clause 53.13 of the VPP.
- EPA Victoria requirements, if applicable.
- A description of the proposal, including the types of processes to be utilised, materials to be stored, hazard management, including management of any battery equipment, and measures for the management or treatment of waste.
- Potential amenity impacts, which may include:
 - noise
 - glint and glare
 - light spill
 - emissions to air, land or water
 - odour.
- The effect of traffic to be generated on access roads, including a traffic management plan (and glint and glare management to address road safety).
- The impact on Aboriginal or non-Aboriginal cultural heritage. This should consider:
 - Aboriginal Heritage Regulations 2007* (which may include preparation of a Cultural Heritage Management Plan)
 - Commonwealth Native Title Act 1993*.
- The impact of the proposal on any species listed under the *Flora and Fauna Guarantee Act 1988* or the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999*.
- A statement of why the site is suitable for a renewable energy facility, including a calculation of the emissions reduction benefits.
- An environmental management plan including:
 - construction management
 - monitoring, including incident register and response system
 - maintenance
 - ongoing engagement with stakeholders
 - rehabilitation.

Additional approvals

- Obligations under other legislation, such as the *Victorian Wildlife Act 1975* or the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999*.
- Approvals to connect the electricity grid and other infrastructure connections.
- Approval of additional infrastructure, such as transmission lines.
- Environmental effects assessment, if required.
- Country Fire Authority approvals, if required.
- Catchment management authority approvals, if required.

C. Bannerton solar farm case study

The Bannerton Solar Farm is an example of co-location of solar energy generation and agriculture. It is located in Bannerton, 100 kilometres south-west of Mildura, on a 192-hectare site, and has a generation capacity of up to 110 MW.

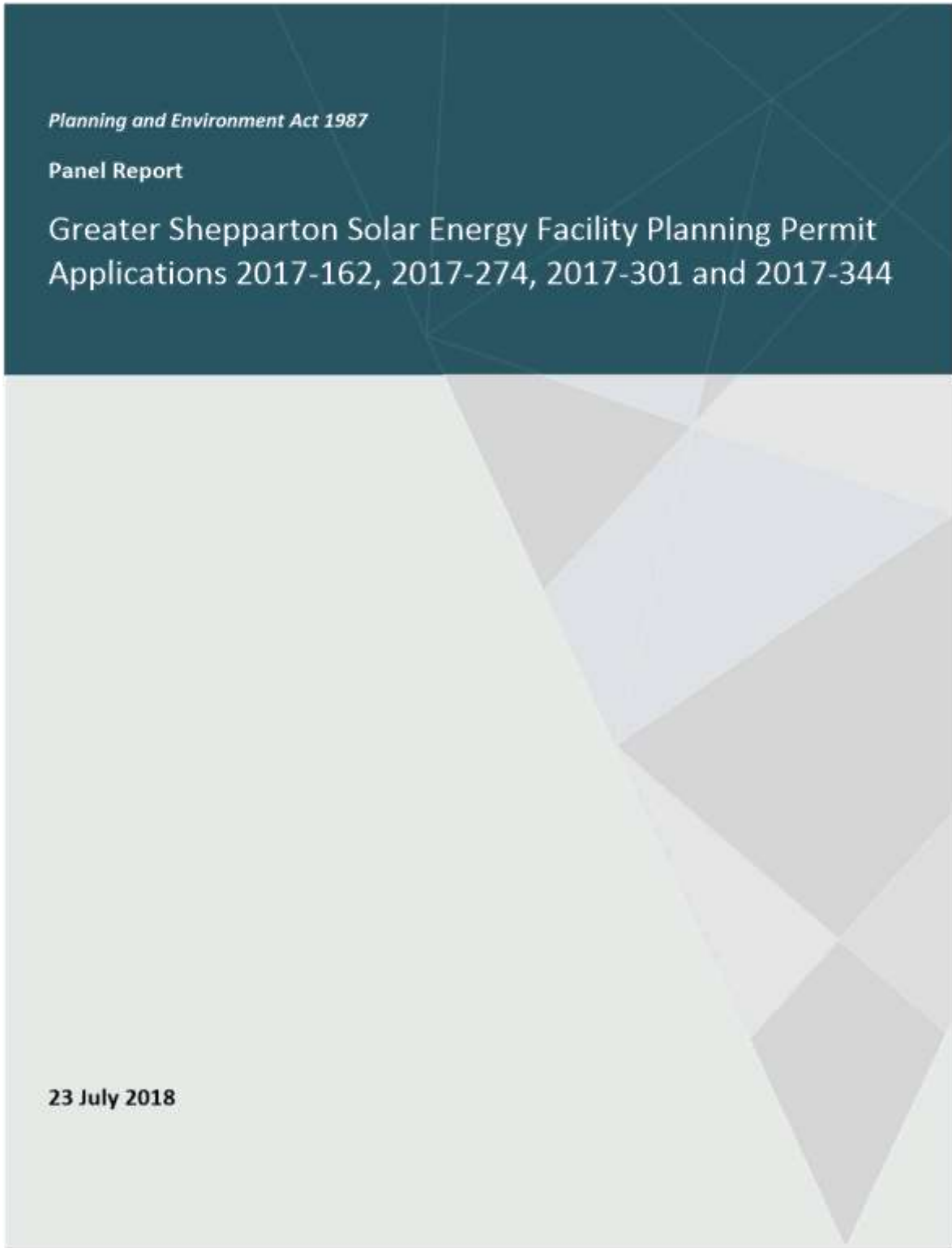
The Bannerton Solar Farm has been constructed on land owned by Almas Almonds farms. The land was not suitable for planting due to the high clay content in the soil. The site experiences long days and good levels of solar radiation, which peak in summer when the electricity load from irrigation is at its peak, making it suitable for construction of a solar energy facility.

This development has benefited the community by providing approximately 180 construction jobs, and by providing grants of up to \$5000 to local community groups and organisations. Community engagement was also embedded in the process, with the first consultation sessions being held in 2016.

The Clean Energy Finance Corp invested in this project on behalf of the Australian Government. As part of the Victorian Government Solar Trams project, the Bannerton Solar farm will supply clean power to Melbourne's Tram Network and other sources, and in the future may contribute to agricultural 'value-add' activities, such as freezing and cool room storage operations.



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Planning and Environment Act 1987

Panel Report pursuant to section 25 of the Act

Greater Shepparton Solar Energy Facility Planning Permit Applications 2017-162, 2017-274, 2017-301 and 2017-344

23 July 2018



Mr Con Tsotsoros, Chair



Ms Amanda Cornwall, Member



Dr Ken Joyner, Member



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List of Abbreviations

AHD	Australian Height Datum
ARI	Average Recurrence Interval
CFA	Country Fire Authority
DELWP	Department of Environment, Land, Water and Planning
EPA	Environment Protection Authority
GMID	Goulburn-Murray Irrigation District
GMW	Goulburn-Murray Water
GWh	Gigawatt hours
MW	Megawatts
PV	Photovoltaic
PVHI	Photovoltaic heat island
Planning Scheme	Greater Shepparton Planning Scheme
VCAT	Victorian Civil and Administrative Tribunal

Overview

Permits summary	
The permit applications	Greater Shepparton Solar Energy Facility Planning Permit Applications 2017-162, 2017-274, 2017-301 and 2017-344
Subject land	2017-162: Tatura East 2017-274: Tallygaroopna 2017-301: Lemnos 2017-344: Congupna
The Applicants	CleanGen for 2017-162 Neoen for 2017-301 X-Elio for 2017-274 and 2017-344
Responsible Authority	Minister for Planning
Notice	Permit applications were advertised for 14 days by sending notices to owners and occupiers of adjoining land, placing a sign on the site and publishing a notice in: <ul style="list-style-type: none"> - Tatura Guardian on 13 June 2017 for 2017-162 - Shepparton News on 29 September 2017 for 2017-274 - Shepparton News on 17 November 2017 for 2017-301 and 2017-344
Submissions	Tatura East: 39 Tallygaroopna: 5 Lemnos: 20 Congupna: 5 Concerning all permit applications: 3
Panel process	
The Panel	Con Tsotsoros (Chair), Amanda Cornwall and Ken Joyner
Directions Hearing	10 April 2018, Shepparton
Panel Hearing	14, 15, 16, 17 and 28 May 2018, Shepparton
Site inspections	Unaccompanied, 10 April and 27 May 2018
Appearances	See Appendix B
Citation	Permit Applications: 2017-162, 2017-274, 2017-301 and 2017-344
Date of this Report	23 July 2018

Executive summary

(i) Summary

The Shepparton Irrigation Area forms part of the broader Goulburn Valley Irrigation District. The Goulburn Valley is often referred to as Victoria's Food Bowl. In 2015/16, the Goulburn-Broken Region had almost \$2 billion in agricultural production, which included \$1.2 billion in the horticultural and dairy industries.

In 2010, Greater Shepparton City Council (Council) published its Large-Scale Solar Power Plant Investor Prospectus which identified that Council strongly supports a large-scale solar energy facility in Shepparton. It referenced research which determined that the municipality is ideal for a large-scale solar energy facility because of locational advantages such as the positioning on the 220 kV transmission line network, suitable annual average solar exposure, considerable transmission savings due to Shepparton's close proximity to Melbourne and certainty of supply during high demand. More recently, Council delegates visited China to, among other activities, meet with prospective operators interested in introducing solar energy facilities to the Greater Shepparton region.

The Australian and Victorian governments set renewable energy targets in legislation which changed several times between 2010 and 2017. Both governments have financial incentive schemes to support the significant investment required in new renewable energy generation capacity to meet the targets. In 2017, the Victorian government legislated new renewable energy targets for 2020 and 2025 and a Renewable Energy Auction scheme.

In 2017, four permit applications were submitted to Council. Greater Shepparton Solar Energy Facility Planning Permit Applications 2017-162, 2017-274, 2017-301 and 2017-344 seek to use and develop Farming Zone land for solar energy facilities in Tatura East, Tallygaroopna, Lemnos and Congupna respectively. Collectively, the four facilities are proposed on 827.9 hectares comprising 849,800 solar panels with the ability to generate 243 megawatts.

In response to statutory notice of each application, 39 submissions were received for the Tatura East proposal, five for Tallygaroopna, 19 for Lemnos and five for Congupna.

Key issues raised in objecting submissions related to:

- agricultural land loss and impact on water infrastructure
- environmental and economic impacts
- alignment with planning policy
- suitability of the proposals in the Farming Zone
- temperature change on neighbouring land
- effect on horticulture, livestock and insects
- glare and glint, noise, light and other potential amenity impacts
- visual impact
- fire management and construction management
- impact on property value.

At its November 2017 meeting, Council resolved to request that the Minister for Planning decide the solar energy facility planning permit applications be referred to be determined by

him. In February 2018, the Minister gave notice that he agreed to Council's request. By that stage, Council's planning officers had assessed the permit applications and recommended that they be approved subject to conditions. Council again resolved not to decide on the permits or to have a position to represent at a future Panel Hearing.

In March 2018, a Panel was appointed to consider the four permit applications and to advise the Minister for Planning.

For each permit application, the Panel must recommend whether a permit should be granted and, if so, what conditions should be applied. The Panel has considered all submissions and evidence presented regarding the applicable policies and provisions of the Greater Shepparton Planning Scheme, and the potential impacts of the solar energy facilities should the permits be granted.

The Panel acknowledges and thanks members of the Greater Shepparton community for their time in preparing their submissions and presenting at the Hearing. It assisted the Panel, when considering each permit application, to better understand their agricultural operations, local circumstances and concerns regarding potential impacts.

Strategic and policy matters

There will be a significant positive environmental effect from generating 243 megawatts of renewable energy. The four proposed solar energy facilities will contribute towards achieving the Victorian Government's renewable energy target of 25 per cent of total energy generation by 2020 and 40 per cent by 2025.

Using the subject land for the facilities will result in an estimated loss of low-value agricultural production of between \$700,000 and up to \$1.3 million each year or about 0.1 per cent and up to 0.2 per cent of the Irrigation District's annual agricultural production. Two to four farming jobs are expected to be lost.

However, the facilities will have a positive economic effect on the Greater Shepparton region through, among other things:

- capital investment of \$307 million, of which an estimated \$51 million will flow to the local economy
- 850 full-time equivalent jobs during construction and 35 ongoing jobs.

Some of the economic effects, such as new local job opportunities, local expenditure and community funding by the applicants, will translate into notable positive social effects.

Future investment in the Irrigation District's water infrastructure is not expected to result in sufficient water for all land in the District. Accordingly, using and developing the subject sites for solar energy facilities will reduce potential future demand for water, enabling it to be available to other agricultural operators. Goulburn-Murray Water's operations and revenue will be unaffected by the subject land being unirrigated because there will be no change to its costs, operations or revenue. Importantly, the subject land owners will continue to contribute financially to the District's irrigation infrastructure by paying annual water charges and fees to Goulburn-Murray Water.

The Panel finds that the four proposed solar energy facilities can achieve State, regional and local planning policies on agriculture and renewable energy. The use of the subject land

areas for solar energy facilities is consistent with priority agricultural land-use in State planning policy and uses in the Farming Zone. Using and developing the subject sites for solar energy facilities can, subject to appropriate permit conditions, harmoniously achieve agricultural production and renewable energy outcomes. The four proposed solar energy facilities, individually and cumulatively, will not remove agricultural land to the extent that would conflict with State or local planning policy.

Common issues

Temperature and effect on horticulture, livestock and insects

The Panel finds that, while limited, there is sufficient scientific evidence to determine that none of proposed solar energy facilities will increase temperature beyond 30 metres of a photovoltaic array. The precautionary principle therefore does not apply and Council's proposed generic 50-metre setback of the solar arrays from the subject site boundaries is not required to address temperature. Any temperature increase within 30 metres will be negligible, however, any photovoltaic array should be separated by this distance from any neighbouring property boundary. Accordingly, neighbouring residences, orchards, horticulture, farming for cattle and livestock, and insect population numbers will not be impacted by the solar energy facilities.

Glare and glint and solar panel night tilt position

The proposed solar energy facilities will not generate unacceptable glare and glint on neighbouring land. Each facility's solar panels do not need to be tilted at night to address potential on-site or off-site impacts. There may be operational reasons to tilt solar panels at night, however, each solar energy facility operator is best placed to decide when and how this should occur and this does not need to be specified as a specific permit condition.

Noise, light and other potential amenity impacts

Noise levels from the solar energy facilities are expected to comply with Environment Protection Authority noise guidelines and standards. The noise guidelines and standards should not be duplicated as planning permit conditions. The statement proposed in a future section 173 agreement requiring the facility operator to accept and acknowledge surrounding farming disturbance is unenforceable and should be deleted.

Visual impact

Landscape screening vegetation should be provided to soften views to the solar panels and buildings and to provide screening from adjoining residences. The screening vegetation should be at least seven metres deep and three metres tall, but its extent will vary depending on individual circumstances. Each applicant should have a vegetation maintenance program, which includes the replacement of any dead or diseased plants. Fencing should be designed to minimise visual impact on neighbouring properties.

Fire, bushfire, emergency and construction management, civil construction and decommissioning

Fire, bushfire and emergency management matters can be satisfactorily managed through permit conditions. The draft permit conditions, specifically the Construction Site Management Plan requirements, will satisfactorily address amenity related matters during the construction phase. The requirement to decommission the facility should be in the form of a permit condition rather than a section 173 agreement and applied to the operator.

Farming Zone

The Farming Zone is appropriate for the four solar energy facilities. The facilities are of a scale which cannot be accommodated in existing industrial zoned areas. They will not adversely impact surrounding existing and future farm operations, or the broader Irrigation District. The soil types on the subject land are lower quality than other parts of the Irrigation District with higher value agricultural production.

Permit condition drafting

The Panel considers that many of the permit condition changes ventilated during the “without prejudice” discussion will clarify intent, result in better land-use outcomes, remove duplication, improve future decision processes regarding matters before, during and after the construction of each solar energy facility.

Future strategic guidance

Many submitters sought strategic guidelines to support permit applications for solar energy facilities. The Panel agrees with these submitters to the extent that the overall permit decision process would have been clearer and further expedited if there was additional and more detailed strategic guidance. While limited, there was sufficient decision guidance to assess each planning permit application on its individual merits. The shared information achieved through a single Panel process for the four permit applications significantly offset this limitation and introduced new efficiencies.

However, future solar energy facilities may have a cumulative adverse effect on the agricultural production on the Irrigation District, therefore future permit applications would benefit from further guidance on where they should be located in Victoria. This is outside the scope of the four permit assessments.

(ii) Recommendations

Based on the reasons set out in this report, the Panel recommends:

- 1. The Minister for Planning issue Planning Permit 2017-162 with the conditions shown in Appendix D to this report.**
- 2. The Minister for Planning issue Planning Permit 2017-274 with the conditions shown in Appendix E to this report.**
- 3. The Minister for Planning issue Planning Permit 2017-301 with the conditions shown in Appendix F to this report.**

4. The Minister for Planning issue Planning Permit 2017-344 with the conditions shown in Appendix G to this report.

The Panel further concludes that the Victorian Government should consider preparing relevant guidelines to assist with the preparation, assessment and decision of future permit applications proposing a solar energy facility. The Panel's discussion and conclusions provide some insight into the types of matters which could be included in these guidelines.

1 Introduction

1.1 The permit applications

Figure 1 Subject land locations



Source: <http://mapshare.maps.vic.gov.au/vicplan> and Planning Panels Victoria

Responsible authority: Minister for Planning

Council: Greater Shepparton City Council

Proposals: Use and develop land for solar energy facilities.

Land to be developed: 827.9 hectares

Number of solar panels: 849,800

Power generation: 243MW

Zone: The Farming Zone applies to all subject land and its purpose is:

- To implement the State Planning Policy Framework and the Local Planning Policy Framework, including the Municipal Strategic Statement and local planning policies.
- To provide for the use of land for agriculture. To encourage the retention of productive agricultural land.
- To ensure that non-agricultural uses, including dwellings, do not adversely affect the use of land for agriculture.
- To encourage the retention of employment and population to support rural communities.
- To encourage use and development of land based on comprehensive and sustainable land management practices and infrastructure provision.

(i) 2017-162 (Tatura East)**Figure 2** 2017-162 Tatura East subject land

Source: <http://mapshare.maps.vic.gov.au/vicplan> and Planning Panels Victoria

Address:	610 Ferguson Road, Tatura East
Land area:	125 hectares
Zone and overlay:	Farming Zone with no overlay
Land description:	The subject land is used for hay farming and grazing. The northern balance of the land comprises a residence and agricultural land. Large commercial orchard and rural lifestyle properties are north of the subject land while small farms with activities including beef cattle breeding and grazing are located to the east. To the south are residences and rural lifestyle properties and to the west are rural lifestyle and farming properties (beef cattle breeding and grazing).
Proposal:	Land to be developed: 90 hectares Number of solar panels: 162,900 Power generation: 45MW
Permit requirement:	A permit is required to: <ul style="list-style-type: none"> • use land for a Renewable Energy Facility (Farming Zone Clause 35.07-1) • buildings and works (Farming Zone Clause 35.07-4) • buildings and works (Land Subject to Inundation Overlay Clause 44.04-1).
Section 55 Referrals:	Goulburn Broken Catchment Management Authority (Recommending)
Section 52 Notice:	Ausnet Services and Goulburn-Murray Water

(ii) 2017-274 (Tallygaroopna)**Figure 3** 2017-274 Tallygaroopna subject land

Source: <http://mapshare.maps.vic.gov.au/vicplan> and Planning Panels Victoria

Address: 235 Victoria Road, Tallygaroopna

Land area: 95.9 hectares

Overlays: Floodway Overlay and Land Subject to Inundation Overlay

Land description: The site is irregularly shaped and flat. There is a dwelling with associated shedding located on the south-east corner of the site. The land has been used for agricultural, primarily cropping and grazing. There are established trees in the northern area of the land with established trees to the south of the dwelling. The rest of the site is predominately clear of vegetation.

The surrounding area is used for agricultural or farming purposes. The site is located approximately 2.3 kilometres east of the township of Tallygaroopna, and approximately 15 kilometres northeast of Shepparton.

Proposal: Number of solar panels: 90,900
Power generation: 30MW

Permit requirement: A permit is required to:

- use land for a Renewable Energy Facility (Farming Zone Clause 35.07-1)
- buildings and works (Farming Zone Clause 35.07-4)
- buildings and works (Land Subject to Inundation Overlay Clause 44.04-1)
- erect and display business identification signage not more than three square metres (Clause 52.05-10)
- remove three native trees (Clause 52.17-2).

Section 55 Referrals: Goulburn Broken Catchment Management Authority (Recommending)

Section 52 Notice: Powercor and Goulburn-Murray Water

(iii) 2017-301 (Lemnos)

Figure 4 2017-301 Lemnos subject land



Source: <http://mapshare.maps.vic.gov.au/vicplan> and Planning Panels Victoria

Address: 1190 and 1220 Cosgrove-Lemnos Road, 260 Tank Corner East Road, 875 Boundary Road and 85 Crooked Lane, Lemnos

Land area: 482 hectares

Overlays: Floodway Overlay and Land Subject to Inundation Overlay

Proposal: Number of panels: 400,000
Power generation: 100MW

Permit requirement: A permit is required to:

- use land for a Renewable Energy Facility (Farming Zone Clause 35.07-1)
- buildings and works (Farming Zone Clause 35.07-4)
- buildings and works (Floodway Overlay Clause 44.03-1)
- buildings and works (Land Subject to Inundation Overlay Clause 44.04-1).

Section 55 Referrals: Goulburn Broken Catchment Management Authority (Recommending), Ausnet Services (Determining), and Department of Environment, Land, Water and Planning (Recommending)

Section 52 Notice: Ausnet Services, Goulburn-Murray Water and Country Fire Authority

(iv) 2017-344 (Congupna)**Figure 5** 2017-344 Congupna subject land

Source: <http://mapshare.maps.vic.gov.au/vicplan> and Planning Panels Victoria

Address:	1090 Lemnos North Road, Congupna
Land area:	160 hectares
Abutting zone:	Road Zone Category 1 and 2
Overlays:	Floodway Overlay and Land Subject to Inundation Overlay
Proposal:	Number of solar panels: 196,080 Power generation: 68MW
Permit requirement:	A permit is required to: <ul style="list-style-type: none"> • use land for a Renewable Energy Facility (Farming Zone Clause 35.07-1) • buildings and works (Farming Zone Clause 35.07-4) • buildings and works (Floodway Overlay Clause 44.03-1) • buildings and works (Land Subject to Inundation Overlay Clause 44.04-1) • erect and display business identification signage not more than three square metres (Clause 52.05-10) • remove six native trees (Clause 52.17-2).
Section 55 Referrals:	Goulburn Broken Catchment Management Authority (Recommending)
Section 52 Notice:	Powercor, Goulburn-Murray Water and Country Fire Authority

1.2 Background

Based on Council's Part A submission, the following is a chronology of events:

2001	The Renewable Energy Target (known then as the Mandatory Renewable Energy Target) came into operation
2006	Council released the <i>Greater Shepparton 2030 Strategy Plan</i> . Council anticipated new industries emerging in the face of technological developments.
2009	The Renewable Energy Target was increased to 41,000 GWh (20 per cent of Australia's electricity generation).
2010	Council published its <i>Large-Scale Solar Power Plant Investor Prospectus</i> (Prospectus), which identifies that Council strongly supports the location of a large-scale solar power plan in Shepparton. The Prospectus identifies that research has determined that Shepparton is an ideal site for a large-scale solar power plant, having regard to locational advantages such as the positioning on the Victorian Gas and Electricity Transmission Network with a 220 kV transmission line, annual average solar exposure between 14 and 20 MJ per square metre, considerable transmission savings of around 10 per cent due to Shepparton's close proximity to Melbourne and certainty of supply during times of high demand.
June 2015	The Renewable Energy Target was decreased to 33,000 GWh in 2020
5 June 2017	CleanGen lodged planning permit application 2017-162 (Tatura East)
15 September 2017	X-Elio lodged planning permit application 2017-274 (Tallygaroopna)
19-23 September 2017	Greater Shepparton City Council delegates visited China to, among other activities, meet with operators interested in introducing solar energy facilities to the Greater Shepparton region
13 October 2017	Neoen lodged planning permit application 2017-301 (Lemnos)
19 October 2017	2017-301: Council requested further information regarding aboriginal cultural heritage matters
1 November 2017	The <i>Climate Change Act 2017</i> (Vic) commenced operation
3 November 2017	X-Elio lodged planning permit application 2017-344 (Congupna)
21 November 2017	At its meeting, Council resolved to: <ul style="list-style-type: none"> - request under section 97C of the <i>Planning and Environment Act 1987</i> that the Minister for Planning decide the solar energy facility planning permit applications referred to him - invite the Minister for Planning to establish a process that provides a fair and proper opportunity for all affected stakeholders to be heard
22 November 2017	In line with its resolution, Council wrote to the Minister for Planning
22 December 2017	2017-301: Neoen satisfactorily responded to Council's request
22 January 2018	2017-344: X-Elio provided Council with an endorsed Cultural Heritage Management Plan

13 February 2018	The Minister for Planning gave notice that he agreed to Council's request for him to decide the solar energy facility planning permit applications
20 February 2018	The meeting agenda: - was prepared before the Minister responded to Council's request - included Council officer recommendations that Notice of Decision to grant a permit be issued by Council subject to specified conditions By the time of the meeting, Council was aware of the Minister's agreement to decide the permit applications and changed its resolution accordingly
9 March 2018	A Panel was appointed to consider the four permit applications and advise the Minister for Planning

1.3 Without prejudice drafting

Council, the permit applicants and other parties were provided the opportunity to provide tracked changes to the permit conditions. These were discussed "*without prejudice*" on the final day of the Hearing. These changes are discussed throughout the report, and where accepted by the Panel, shown in Appendices D1, D2, D3 and D4.

1.4 Issues dealt with in this Report

The Panel considered all written submissions made in response to the notice of the permit applications, observations from site visits, and submissions, evidence and other material presented to it during the Hearing.

The Panel has reviewed a large volume of material. The Panel has had to be selective in referring to the more relevant or determinative material in the report. All submissions and materials have been considered by the Panel in reaching its conclusions, regardless of whether they are specifically mentioned in the report.

The Panel has considered each permit application on its individual merits. However, this report presents the issues under the following headings:

- Planning context
- Strategic and policy matters
- Common issues
- Specific permit matters.

2 Planning context

The following planning context is common to each permit application. The Greater Shepparton Planning Scheme (Planning Scheme) zones and overlays share a common purpose to implement the State and Local Planning Policy Frameworks.

2.1 Policy framework

State	
Clauses	
10	State Planning Policy Framework
	<ul style="list-style-type: none"> ▶ 10.01 Integrated decision making Planning authorities and responsible authorities should endeavour to integrate the range of policies relevant to the issues to be determined and balance conflicting objectives in favour of net community benefit and sustainable development for the benefit of present and future generations.
11	Settlement
	<ul style="list-style-type: none"> ▶ 11.12 Hume <ul style="list-style-type: none"> ▶ 11.12-1 A diversified economy To develop a more diverse regional economy while managing and enhancing key regional economic assets. <i>Strategies:</i> <ul style="list-style-type: none"> - Plan for a more diverse and sustainable regional economy by supporting existing economic activity and encouraging appropriate new and developing forms of industry, agriculture, tourism and alternative energy production. - Support agricultural production through the protection and enhancement of infrastructure and strategic resources such as water and agricultural land, including areas of strategic agricultural land. - Create renewable energy hubs that support co-location of industries to maximise resource use efficiency and minimise waste generation.
14	Natural resources management
	<ul style="list-style-type: none"> ▶ Planning is to assist in the conservation and wise use of natural resources including energy, water, land, stone and minerals to support both environmental quality and sustainable development. ▶ 14.01 Agriculture To protect productive farmland which is of strategic significance in the local or regional context. <i>Strategies:</i> <ul style="list-style-type: none"> - Ensure that the State's agricultural base is protected from the unplanned loss of productive agricultural land due to permanent changes of land-use. - Consult with the Department of Economic Development, Jobs, Transport and Resources and utilise available information to identify areas of productive agricultural land. - Take into consideration regional, state and local, issues and characteristics in the assessment of agricultural quality and productivity. - Permanent removal of productive agricultural land from the State's agricultural base must not be undertaken without consideration of its economic importance for the agricultural production and processing sectors. <p>In considering a proposal to subdivide or develop agricultural land, the following factors must be considered:</p> <ul style="list-style-type: none"> - The desirability and impacts of removing the land from primary production, given its agricultural productivity.

- The impacts of the proposed subdivision or development on the continuation of primary production on adjacent land, with particular regard to land values and to the viability of infrastructure for such production.
- The compatibility between the proposed or likely development and the existing uses of the surrounding land.
- Assessment of the land capability.

19 Infrastructure

▶ 19.01 Renewable energy

▶ 19.01-1 Provision of renewable energy

To promote the provision of renewable energy in a manner that ensures appropriate siting and design considerations are met.

Strategies:

- Facilitate renewable energy development in appropriate locations.
- Protect energy infrastructure against competing and incompatible uses.
- Develop appropriate infrastructure to meet community demand for energy services and setting aside suitable land for future energy infrastructure.
- In considering proposals for renewable energy, consideration should be given to the economic and environmental benefits to the broader community of renewable energy generation while also considering the need to minimise the effects of a proposal on the local community and environment.

Local

Clauses

21 Municipal Strategic Statement

▶ 21.06 Economic development

▶ 21.06-1 Agriculture

Irrigated primary production and the processing of that product underpin the municipality and the Region's economy. The level of production is nationally important and the region is responsible for significant parts of the nation's milk production, deciduous canned fruit production, stone fruit crop and tomato processing production.

...

It is increasingly evident that prospective agricultural investment is jeopardized, deterred, or completely lost by land uses and developments that have the potential to compromise the scale and location of such investment. In particular, agricultural investment is far less likely where land is already fragmented in ownership with housing dispersed throughout.

Objectives – Agriculture

- To ensure that agriculture is and remains the major economic driver in the region.
- To facilitate growth of existing farm businesses.
- To facilitate growth of new agricultural investment.
- To provide for small scale, specialized agriculture.

2.2 Planning provisions

The Victoria Planning Provisions require a responsible authority to consider the State Planning Policy Framework and the Local Planning Policy Framework, including the Municipal Strategic Statement and local planning policies. This is also reflected in the purpose of the Planning Scheme zones and overlays.

In addition to the decision guidelines in Clause 65 of the Victoria Planning Provisions, the following clauses are relevant when considering a permit application for a solar energy

facility in a Farming Zone, and where relevant, Floodway Overlay and Land Subject to Inundation Overlay.

(i) Farming Zone

The responsible authority must consider the follow relevant decision guidelines, as appropriate:

General issues

- Any Regional Catchment Strategy and associated plan applying to the land.
- The capability of the land to accommodate the proposed use or development, including the disposal of effluent.
- How the use or development relates to sustainable land management.
- Whether the site is suitable for the use or development and whether the proposal is compatible with adjoining and nearby land uses.
- How the use and development makes use of existing infrastructure and services.

Agricultural issues and the impacts from non-agricultural uses

- Whether the use or development will support and enhance agricultural production.
- Whether the use or development will adversely affect soil quality or permanently remove land from agricultural production.
- The potential for the use or development to limit the operation and expansion of adjoining and nearby agricultural uses.
- The capacity of the site to sustain the agricultural use.
- The agricultural qualities of the land, such as soil quality, access to water and access to rural infrastructure.
- Any integrated land management plan prepared for the site.

Environmental issues

- The impact of the proposal on the natural physical features and resources of the area, particularly soil and water quality.
- The impact of the use or development on the flora and fauna on the site and its surrounds.
- The need to protect and enhance the biodiversity of the area, including the retention of vegetation and faunal habitat and the need to revegetate land including riparian buffers along waterways, gullies, ridgelines, property boundaries and saline discharge and recharge area.
- The location of on-site effluent disposal areas to minimise the impact of nutrient loads on waterways and native vegetation.

Design and siting issues

- The need to locate buildings in one area to avoid any adverse impacts on surrounding agricultural uses and to minimise the loss of productive agricultural land.
- The impact of the siting, design, height, bulk, colours and materials to be used, on the natural environment, major roads, vistas and water features and the measures to be undertaken to minimise any adverse impacts.

- The impact on the character and appearance of the area or features of architectural, historic or scientific significance or of natural scenic beauty or importance.
- The location and design of existing and proposed infrastructure including roads, gas, water, drainage, telecommunications and sewerage facilities.
- Whether the use and development will require traffic management measures.

(ii) Floodway Overlay and Land Subject to Inundation Overlay

The responsible authority must consider the following collective decisions guidelines, as appropriate:

- Any local floodplain development plan or flood risk report.
- Any comments of the relevant floodplain management authority.
- The Victorian River Health Strategy (2002) and any relevant regional river health strategy and associated wetland plan.
- The existing use and development of the land.
- Whether the proposed use or development could be located on flood-free land or land with a lesser flood hazard outside this overlay.
- The susceptibility of the development to flooding and flood damage.
- The potential flood risk to life, health and safety associated with the development. Flood risk factors to consider include:
 - The frequency, duration, extent, depth and velocity of flooding of the site and accessway.
 - The flood warning time available.
 - The danger to the occupants of the development, other floodplain residents and emergency personnel if the site or accessway is flooded.
- The effect of the development on redirecting or obstructing floodwater, stormwater or drainage water and the effect of the development on reducing flood storage and increasing flood levels and flow velocities.
- The effect of the development on river health values including wetlands, natural habitat, stream stability, erosion, environmental flows, water quality and sites of scientific significance.

(iii) Clause 52.42 (Renewable energy facility (other than wind energy facility and geothermal energy extraction))

Clause 52.42 seeks to *“facilitate the establishment and expansion of renewable energy facilities, in appropriate locations, with minimal impact on the amenity of the area.”*

The responsible authority must consider the follow decision guidelines, as appropriate:

- The effect of the proposal on the surrounding area in terms of noise, glint, light spill, vibration, smell and electromagnetic interference
- The impact of the proposal on significant views, including visual corridors and sightlines.
- The impact of the proposal on the natural environment and natural systems.
- Whether the proposal will require traffic management measures.

2.3 Planning strategies or policies

(i) Hume Regional Growth Plan

The Hume Regional Growth Plan is one of eight regional growth plans that provide broad direction for land-use and development across regional Victoria. Section 11.2 (Agriculture) states:

The Hume Region will continue to be one of Australia's major food-producing areas. The Goulburn Valley is part of the Goulburn Murray Irrigation District, which is a significant agricultural area and is expected to continue to deliver a significant proportion of Victoria's agricultural product currently about 25 per cent of the total value of the state's agricultural production. Agricultural production will be supported through the protection and enhancement of key agricultural assets including land and water resources.

It seeks to:

- Support the protection of strategic farmland
- Support and manage intensive agricultural production
- Support changing farm sizes, methods, strategies and land uses
- Plan for the potential impacts of climate change on agriculture
- Respond to a changing irrigation landscape
- Minimise fragmentation of agricultural land
- Avoid conflicting land uses and activities
- Maintain and enhance infrastructure supporting rural industry.

Section 11.3 (Energy and earth resources) states:

- a) *Explore opportunities for renewable energy generation and alternative waste treatment*

Factors affecting future energy demands in the Hume Region include:

- rising electricity costs
- the high price of bottled liquefied petroleum gas and the limited coverage of the reticulated gas network, combined with hot summers and cold winters
- long-distance commuting
- the needs of the region's larger, more energy intensive industries.

Developing alternative energy sources such as solar, wind, geothermal, bioenergy and biofuels will contribute to securing a sustainable energy future for the region.

Opportunities exist in the region for sustainable electricity generation in close proximity to existing electricity distribution infrastructure. Potential and existing alternative energy resources in the region include:

- ...
- solar energy, particularly in the northern parts of the region
- ...

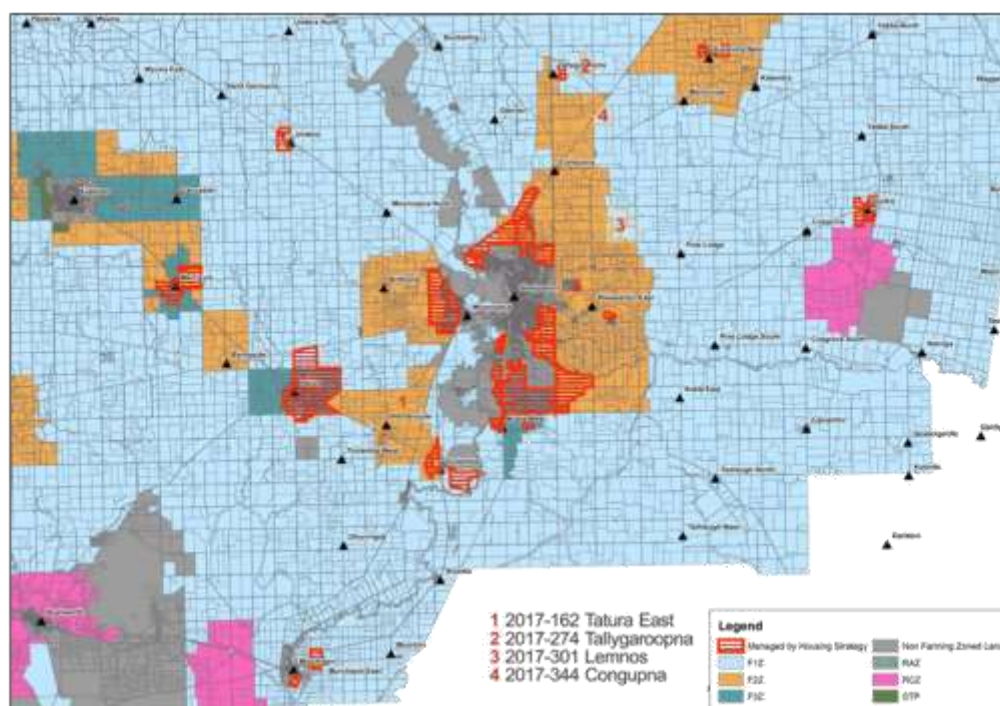
- *other opportunities for local power generation and distribution.*

The Hume Regional Growth Plan has been implemented in State planning policy through Clause 11.12 of all Victorian planning schemes.

(ii) Campaspe, Greater Shepparton and Moira Regional Rural Land Use Strategy 2008

Planning Scheme Clause 21.06 refers to the Campaspe, Greater Shepparton and Moira Regional Rural Land Use Strategy 2008 (RRLUS). RRLUS seeks to secure and promote the future of agriculture across the Greater Shepparton, Campaspe and Moira region and was introduced into the Planning Scheme on 19 September 2013. It categorises farming areas as Growth (F1Z), Consolidation (F2Z) and Niche areas (F3Z), as shown in Figure 6.

Figure 6 Regional Rural Strategy farm land categories



Source: RRLUS 2008

The Tallygaroopna, Lemnos and Congupna proposals are on land in the Growth (F1Z) area. Their combined subject land area comprises 737.0 hectares (or 0.4 per cent) of the total 185,277 hectares of Growth farming area. The Tatura East proposal is on land in the Consolidation area (F2Z) and comprises 125 hectares (or 0.4 per cent) of the total 28,589 hectares of Consolidation farming land.

2.4 Relevant solar energy application

The Minister for Planning appointed an Advisory Committee to review an Application for Review P1841/2017 called in from the Victorian Civil and Administrative Tribunal (VCAT) for

an application to amend Planning Permit Application: Pln 16/132 for a Solar Wind Farm at Eldorado Road, North Wangaratta.

The Advisory Committee supported the expansion of the Wangaratta solar energy facility and concluded:

The proposed expansion of the solar farm represents a significant investment in the Wangaratta area, and will provide economic stimulation to the region, and increased energy security for other businesses and industries in the region, as well as the broader regional community. The solar farm will also assist Victoria to reduce its overall carbon emissions, and contribute to reaching the State's renewable energy generation targets. These are positive environmental and social outcomes for the region, and for the State more broadly.

On 20 July 2017, a Notice of Decision to grant an amended permit was issued by the Rural City of Wangaratta.

2.5 Legislation

(i) Planning and Environment Act 1987

The *Planning and Environment Act 1987* objectives are:

- (a) to provide for the fair, orderly, economic and sustainable use, and development of land
- (b) to provide for the protection of natural and man-made resources and the maintenance of ecological processes and genetic diversity
- (c) to secure a pleasant, efficient and safe working, living and recreational environment for all Victorians and visitors to Victoria
- (d) to conserve and enhance those buildings, areas or other places which are of scientific, aesthetic, architectural or historical interest, or otherwise of special cultural value
- (e) to protect public utilities and other assets and enable the orderly provision and co-ordination of public utilities and other facilities for the benefit of the community
- (f) to facilitate development in accordance with the objectives set out in paragraphs (a), (b), (c), (d) and (e)
- (g) to balance the present and future interests of all Victorians.

(ii) Climate Change Act 2017 (Vic)

The *Climate Change Act 2017* commenced operation on 1 November 2017 and seeks, among other purposes, to set a long-term greenhouse gas emissions reduction target and to provide the setting for five-yearly interim reduction targets to reach the long-term target. Section 6 states that for the purposes of the Act, "the long-term emissions reduction target for the State is an amount of net zero greenhouse gas emissions by the year 2050".

Section 20 states:

The Government of Victoria will endeavour to ensure that any decision made by the Government and any policy, program or process developed or implemented by the Government appropriately takes account of climate change if it is relevant by having regard to the policy objectives and the guiding principles.

(iii) Renewable Energy Targets

The Australian government operates the Renewable Energy Target scheme under the *Renewable Energy (Electricity) Act 2000* and associated regulations. It has two parts – the Small-scale Renewable Energy Scheme and the Large-scale Renewable Energy Target.

The large-scale Renewable Energy Target scheme creates a financial incentive for the establishment or expansion of renewable energy power stations, such as wind and solar energy facilities or hydro-electric power stations. Legislated annual targets require significant investment in new renewable energy generation capacity in coming years. In June 2015, the Australian government reduced the Renewable Energy Target to 33,000 gigawatt hours, or about 23.5 per cent of Australia’s electricity generation from renewable energy sources by 2020.

The State Government introduced a Renewable Energy Target in 2017 of 25 per cent of Victoria’s electricity generation by 2020 and 40 per cent by 2025. The targets are contained in the *Renewable Energy (Jobs and Investment) Act 2017 (Vic)*. The Department of Environment, Land, Water and Planning (DELWP), on behalf of the Minister for Planning, submitted that, by legislating the targets, the State Government is providing industry with the certainty and confidence to invest in renewable energy projects.

The State Government aims for the renewable energy sector to generate 650 megawatts of energy through its Renewable Energy Auction Scheme. It has sought proposals from the industry to generate renewable energy.

DELWP submitted that the *Renewable Energy Action Plan (DELWP, 2017)* outlines the government’s renewable energy policy agenda and the pathway to meet Victoria’s energy goals. It added:

The plan supports accelerating large-scale renewable energy generation to strengthen the affordability, reliability and resilience of Victoria’s energy system, and to create new jobs and industry growth to empower households, businesses and communities during the state’s transition to a low-carbon economy.

3 Strategic and policy matters

3.1 Background

Section 60 of the Act requires a responsible authority to consider, among other things, State and local planning policies, and any significant environmental, social and economic impacts of the proposed land-use when considering a planning permit application. A purpose of zones and overlays in the Planning Scheme is to implement the State and Local Planning Policy Frameworks, including the Municipal Strategic Statement and local planning policies.

This chapter discusses policy and strategic matters related to agriculture and renewable energy.

(i) Context

Council's *Large-Scale Solar Energy Power Plant Investor Prospectus* describes its strong support for a large-scale solar power plan in Shepparton. It identifies Shepparton as an ideal site for a large-scale solar power plant because of its position on the Victorian Gas and Electricity Transmission Network with a 220-kilovolt transmission line, annual average solar exposure between 14 and 20 megajoules per square metre, and considerable transmission savings of around 10 per cent due to Shepparton's proximity to Melbourne and certainty of supply during times of high demand.

The permit applicants submitted that they conducted a detailed analysis to find appropriate sites for developing solar energy facilities. Key factors for their site selection were excellent solar source, easily accessible land, flat topography, willing property owners, near an electricity grid connection point with available capacity, and land that is not used for high value horticulture or dairy.

Council submitted that the four permit applications would result in 827.9 hectares of land used for dryland agriculture in the Greater Shepparton Irrigation District being developed for renewable energy facilities. The facilities would total 849,800 solar panels with the ability to generate 243 megawatts of electricity. That will significantly contribute towards the State Government's Renewable Energy Target of 40 per cent of electricity generation by 2025.

(ii) Economics and agriculture expert witness conference statement

The Panel directed that economics and agriculture expert witness meet to agree on key issues in dispute and key assumptions before the Hearing. The following expert witnesses met on 9 May 2018:

- Mr Rendell of RMCG on agriculture and economics called by Council
- Mr Appels of Frontier Economics on economics called by X-Elio
- Mr Noronha of Essential Economics on economics called by CleanGen
- Mr Phillips of Phillips Agribusiness on agriculture called by Neoen.

Experts discussed an overarching proposition and 10 underlying propositions and either agreed, agreed with a qualifier or note, or stated it was not their area of expertise. These propositions are shown in the relevant sections of this chapter. No expert disagreed with any proposition or key assumption specified in the conference statement (Document 11a).

3.2 Agricultural production

(i) The issue

The issue is whether the permit applications will result in an unacceptable impact on agricultural production in the region.

(ii) Expert witness conference statement

The relevant experts generally agreed:

Overarching proposition

The impact of the solar farms on the region's agricultural production is considered small (\$0.7million - \$1.3million/year gross income per annum i.e. 0.1%-0.2% of the City of Shepparton's regional agricultural production). This would reduce farm jobs by 2-4 FTE.

This small impact is because it will not affect the dairying or horticulture industries which are the major contributors to the regions agriculture.

Underlying propositions

- *Agriculture is important and worth close to \$2billion, but the dairy industry and horticulture industry are the most critical as they comprise \$1.1billion and have significant regional processing industries.*
- *The strategic value of the land varies depending upon soil type and whether water is accessible. Thus the sites suitable for dairy and horticulture that lie within the Shepparton and Central Goulburn districts have a higher strategic value.*
- *The agricultural capability of the sites has been assessed as:*
 - *Tatura – is well suited to horticulture, mixed irrigation/cropping/grazing or dryland and is only suitable as an adjunct to a dairy farm.*
 - *Lemnos - Small area suited to horticulture, most suited to irrigated cropping/grazing and possible conversion to dairy.*
 - *Tallygaroopna – Half the site is similar to adjacent horticulture on soils considered fair for horticulture. The whole site is most suited to mixed irrigation cropping/grazing or dryland.*
 - *Congupna - Is suitable to dryland agriculture or if developed, possibly irrigation/ cropping/ grazing.*
- *The current land-use is mixed cropping and grazing with varying degrees of irrigation on the various sites. The total estimated value of agricultural production is \$0.9million and \$1.3million and 3-4 full-time equivalent labour units. This is 0.2% of the City of Shepparton's agricultural production.*
- *The value of the loss of land is based not on the theoretical potential of the individual site, but is equivalent to the value of dryland production at each site.*
- *The estimated loss of land is collectively 832.4ha which is currently producing a gross income of \$0.9million to \$1.3million. If the current water*

use was used elsewhere, then the sites' production loss is estimated to be equivalent to dryland conditions of \$0.7mill income. This represents 0.1% of the agricultural production in the City of Greater Shepparton and about 2 lost farm jobs.

- *The impact of loss of land on upstream and downstream regional activities is considered small. This is because the land-use lost (irrigation and dryland cropping/grazing) has relatively low inputs and relatively low downstream regional processing.*
- *As far as the experts know there will be no impact on the agricultural production on surrounding properties, though we make no assessment on the micro climate effect for horticulture.*
- *The proposed solar farms will result in economic activity (jobs, equipment and materials) during both the construction and the ongoing maintenance.*

Where this information appears in individual expert witness statements, it is not duplicated in the following section of this chapter.

(iii) Evidence

Mr Rendell's expert evidence was that dairy and horticulture are the higher value agricultural production, accounting for 70 per cent of the value of agricultural output in 2016. He highlighted that overall agricultural output in the City of Greater Shepparton was worth \$550 million in 2016, while food manufacturing was worth \$918 million. Agricultural production in the Goulburn Broken Catchment was nearly \$2 billion.

Mr Rendell stated that total area has an approximate gross farm income annually of \$666,000 based upon dryland production producing \$800 for each hectare of gross income. He explained that, theoretically, three of the four properties could conceivably be used, some partly for horticulture and some for more intensive mixed farming. He cautioned that this would require more water, resulting in land elsewhere needing to retire their use, given water (not land) is the limiting factor in the area. Mr Rendell stated that even with an increased theoretical production of more than \$10 million each year, this would be at the expense of production of a similar scale being lost on land elsewhere in the Irrigation District.

Mr Rendell said that, based on soil types, Tatura, like some parts of the Lemnos subject land, has potential to be converted to horticulture at considerable cost.

Mr Phillips stated that the small proportion of subject land for the four facilities compared to District's total irrigated agriculture, is emphasised when the land resource is viewed against its relatively low-value broad acre agricultural use. He added that the Lemnos site is serviced by the Shepparton Irrigation Area but the land tends to have poorer quality soils than land on the western side of the Goulburn River. He found broad acre cropping under dryland or irrigated conditions to be the best use of the Lemnos property and that the land has a low suitability to horticulture because of its soil type characteristics. Mr Phillips and Mr Rendell agreed that only the Lemnos site has sufficient scale for a dairy property.

(iv) Submissions

Local objectors and organisations such as the Victoria Farmers Federation (VFF) urged the Panel to not support the planning permits because they believed the solar energy facilities would reduce agricultural production in the Irrigation District.

VFF submitted that losing agricultural land to solve another problem is a difficult conundrum. The Goulburn-Murray Irrigation District is known as the Victorian 'Food Bowl'. The area is prime agricultural land which is serviced by irrigation infrastructure that requires a 'critical mass' of users for the full benefits to be realised. It submitted that good planning for Victorian agriculture should support sustainable agriculture and government infrastructure investments.

VFF submitted that the permit applicants, Council and the expert witnesses had not calculated the employment and economic benefits of using the sites for a range of agricultural and horticultural uses when calculating net community benefit. It added that Council incorrectly compared each application to the entire Victorian Food Bowl because each site is identified as strategic agricultural land to be protected from loss.

Goulburn-Murray Water submitted:

The land area and water use associated with the subject properties is not large in the context of the overall GMID. However the absence of guiding principles relating to the location of these and future developments provides a precedent and scope for a proliferation of solar farms and the attendant problems.

It sought to locate future solar energy facilities based on sound planning principles. Goulburn-Murray Water recommended a set of guidelines such as locating solar energy facilities on low quality or marginal agricultural land to reduce impact on agricultural production.

Council submitted that all the economics experts agree that the project sites are used for low-value agricultural enterprises such as cropping and grazing. It considered the sites to be not strategically significant in an irrigated agricultural context, and that removing them would have a minor impact on the Shepparton agricultural economy.

The Committee for Greater Shepparton submitted that it believes in renewable energy and supports the development of solar energy facilities in the region. It qualified this by adding "the driver of the economy is irrigated agriculture, and if this were reduced the regional economy would suffer." It considered that agriculture and solar energy facilities can co-exist, however, it was concerned about setting an undesirable precedent for these facilities on irrigated agricultural land. It supported a set of guidelines that would exclude such facilities on irrigated land in future.

Mr Peter Hall, an orchard owner objecting to the Tatura East permit application, submitted that prime agricultural land must take precedence particularly because the land is located on an irrigated water system that has been extensively planned and moderated way with the objective of preserving agriculture.

At the Hearing, Ms Akers, an objector to the Tallygaroopna permit application, submitted that locating solar energy facilities on land with an irrigation water system undermines the

competitive advantage of agriculture in the region and places the irrigation infrastructure at risk. She said that there is an abundance of land available for solar energy facilities outside the Irrigation District. Ms Akers requested that the State Government develop guidelines for solar energy facilities which help developers to identify appropriate land. She referred to guidelines from the United Kingdom (Document 24) as a sound basis for the Victorian guidelines.

(v) Discussion

The Panel acknowledges the importance of agricultural production in the Irrigation District and throughout Victoria. There is considerable planning policy and broader State government policies seeking to protect productive farmland of strategic significance in the local or regional context.

The Panel accepts the evidence of the economics and agriculture experts that the current land-use and productivity has value and that each site has potential for increased agricultural production. However, this would require considerable investment.

The extent of existing and future irrigated agricultural activity relies on available water supply. According to the expert advice, there is insufficient water to supply all land in the Irrigation District. The Panel agrees with the expert witnesses that removing demand for water on the subject land will enable 832 hectares of other land in the District to secure water for more productive agricultural land. This reflects existing circumstances because the subject land is currently used for dryland grazing and cropping, which is relatively low-value agricultural production.

The Panel accepts consensus in the expert conference statement that losing the existing low-value agricultural production on the subject land represents a loss of \$700,000 gross income each year based on the current dryland agriculture and \$1.3 million each year based on higher value cropping which requires considerable investment. This equates to 0.1 per cent to 0.2 per cent of Greater Shepparton's regional agricultural production (zero when rounded to the closest number). This may be an outcome of the permit applicants selecting each subject site based on, among other key factors, the land not used for high value horticulture or dairy.

Regarding the proposals potentially setting an undesirable precedent, the Panel must consider each permit application on its own merits. However, permit applicants, community members and decision makers would benefit from further strategic guidance on assessing future permit applications proposing a solar energy facility on land in an irrigated agricultural area.

(vi) Conclusion

The Panel concludes:

- The proposed facilities will result in an estimated loss of agricultural production of between \$700,000 and up to \$1.3 million each year or about 0.1 per cent and up to 0.2 per cent of the Irrigation District's annual agricultural production. This equates to zero when rounded to the closest number.

- Future solar energy facilities may, depending on scale, have a cumulative adverse impact on the agricultural production of the Irrigation District, therefore future permit applications would benefit from further guidance on where they should be in Victoria.

3.3 Water infrastructure

(i) The issue

The issue is whether the permit applications will result in an unacceptable impact on the Irrigation District's water infrastructure and associated investment.

(ii) Expert witness conference statement

Underlying proposition

The GMW operations and revenue will be unaffected, as there will be no change to GMW costs, operations or revenue as a result of the land being unirrigated.

The key assumptions that the experts relied on were:

- *The water use in the region has declined significantly that is, it is now 60 per cent compared to 20 years ago.*
- *The modernised GMID system is still effectively servicing the same area and thus there is a large area of farms that do not irrigate.*
- *The infrastructure charge will still be levied on these properties despite there being no irrigation used.*

Where this information appears in individual expert witness statements, it is not duplicated in the following section of this chapter.

(iii) Evidence and submissions

DELWP referred to the Water for Victoria policy and the State Government's \$2 billion Connections Project in the Goulburn-Murray Irrigation District. The Connections Project will upgrade irrigation infrastructure by improving system efficiency and reconfiguring system assets on a channel-by-channel assessment. It has "*identified areas where assets will be rationalised and where properties are not likely to irrigate in the future, which will reduce the costs of supplying water to remaining customers.*"

DELWP submitted that the proposed project sites are not part of the rationalisation that is occurring through the Connections Project. The State Government is working with Goulburn-Murray Water to explore other opportunities, including those presented by these sites, to rationalise irrigation infrastructure for the long-term sustainability of the Irrigation District.

Goulburn-Murray Water provided information on the modernisation project which it explains has achieved multiple benefits for the investors through:

- improved efficiency of irrigation delivery resulting in water savings
- reduced volume of water required from purchasers

- improved service standards for irrigators.

Mr Rendell stated that the amount of water available to irrigators has irreversibly declined because of water law and policy reforms such as water trading and water recovery under the Murray-Darling Basin Plan. He explained that the extent of available land in the Irrigation District is now far greater than water availability. Mr Rendell considered water, not land, to be the limiting factor on agriculture.

Mr Rendell provided detailed information on trends in water use by agricultural sector across the Southern Connected Basin from the 1970s to 2016. The information highlighted the impact of key reforms such as the introduction of water trading in 2001, and periods of drought and drought recovery. It presented a highly sophisticated agricultural sector that is agile in its response to water availability, with water intensive sectors such as dairy and rice expanding production in wet years and dropping away rapidly in dry times.

The economics and agriculture experts agreed that the land-use change at the project sites will not reduce the total water available for irrigated production because the water allocations would be expected to be traded to other properties in the Goulburn-Murray Irrigation District.

Goulburn-Murray Water submitted that water sellers have generally elected to retain their access to irrigation delivery services, resulting in fragmented water use patterns across the District, which it called the 'Swiss cheese effect'. It submitted that the proposed projects would exacerbate this and that *"further conversion of land away from irrigation land-use has the potential to increase cost pressures on remaining irrigators."* As part of its recommended set of guidelines, Goulburn-Murray Water recommended that solar energy facilities be located to provide opportunities to rationalise the footprint of irrigation infrastructure.

At the Hearing, Mr Hannan of Goulburn-Murray Water receded from the proposition in Goulburn-Murray Water's original submission that removing agricultural land from the irrigated district has the potential to increase cost pressures on remaining irrigators. Mr Hannan acknowledged that the land owners of the subject sites will continue to contribute water fees, which mitigates the impact on other customers. He explained that agriculture is adjusting to the fact that water entitlement holders have sold water and there is less water in the system.

Mr Hannan expressed concern that the permit applications may set a precedent for similar future proposals in the Irrigation District.

Ms Akers' submitted that ensuring *"our (water) backbones remain viable is critical to the future viability of the area."* She discussed the 'Swiss cheese effect' and emphasised that in the context of the Basin Plan under which farmers need to give up water assets, a strategic approach is vital. She submitted that Goulburn-Murray Water needs to develop a clear path for an irrigation footprint.

(iv) Discussion

The issue of water attracted passionate and strongly held opinions. The question for the Panel is whether the proposed solar energy facilities will result in an unacceptable effect on irrigation infrastructure which planning policy requires to be protected and enhanced.

There has been considerable investment in the Connections Project which has identified areas where irrigation infrastructure is to be rationalised and where properties are not likely to irrigate in the future. DELWP's submission clearly explains that, although the proposed project sites are not part of the rationalisation project, it is exploring other opportunities to rationalise irrigation infrastructure, including those presented by these sites.

The Panel adopts the joint opinion of the economics experts that Goulburn-Murray Water's costs, operations and revenue will not be affected if the subject sites were not irrigated. The owners of the subject sites will continue to contribute water fees, which mitigates the impact on other customers.

The Panel considers that the four proposed facilities will not fragment water-use patterns to the extent which would result in an unacceptable effect on the Irrigation District. While the cumulative impact of *future* facilities may, depending on location and scale, have an adverse impact, this is outside the scope of the permit assessments and is better addressed through strategic guidance.

The Panel agrees with submitters, including local farm operators, VFF, Goulburn-Murray Water and Committee for Greater Shepparton, that future permit applications proposing solar energy facilities in the Irrigation District would benefit from further strategic guidance.

(v) Conclusions

The Panel concludes that the four permit applications will not result in an unacceptable effect on the Irrigation District's water infrastructure because:

- future investment in Goulburn-Murray Irrigation District's water infrastructure is not expected to result in sufficient water for all land in the District
- using and developing the subject sites for solar energy facilities will reduce potential future demand for water, enabling it to be available to other agricultural operators
- Goulburn-Murray Water's operations and revenue will be unaffected by the subject land being unirrigated because:
 - specifically, subject land owners will continue to contribute financially to the District's irrigation infrastructure by paying annual water charges and fees to Goulburn-Murray Water
 - accordingly, there will be no change to its costs, operations or revenue.
- Future solar energy facilities may, depending on scale, have a cumulative adverse impact on water infrastructure in the Irrigation District, therefore future permit applications would benefit from further guidance on where they should be located in Victoria.

3.4 Environmental, economic and social effects

(i) The issue

The issue is whether using and developing the subject land for solar energy facilities will have any significant environmental, economic or social effects.

(ii) Expert witness conference statement

The economics and agriculture experts' conference statement achieved general agreement, from relevant experts, that the loss of agricultural production will be 0.1 to 0.2 per cent of the regional agricultural production, equating to two to four farming jobs. They agreed that:

- the solar energy facilities will contribute significantly to the regional economy
- the net regional benefit of the facilities will be greater than the loss of agricultural production.

The experts based their statement about positive economic impact on the following key assumptions:

Construction –

- *Capital investment of \$310million (\$50million sourced locally)*
- *Direct employment - 850 jobs (mostly locally sourced)*
- *Contracts for local suppliers*

Operational phase

- *Direct ongoing operating expenses – for example \$1.5 million each year for Tallygaroopna, Congupna and Tatura*
- *Direct employment of 35 jobs*
- *Electricity infrastructure improvements.*

Key factors – for the four sites combined:

- *The agricultural loss is estimated at between \$0.7million (equivalent dryland production) and up to \$1.3million (maximum current production) annually*
- *This represents between 2 and 4 farm jobs lost*
- *These losses are considerably less than the benefits identified above*
- *Stimulus to the local economy through wage spending.*

Where this information appears in individual expert witness statements, it is not duplicated in the following section of this chapter.

(iii) Evidence and submissions

Council provided details for each permit application in its Part A submission. Collectively, the projects will comprise 849,800 solar panels with the ability to generate 243 megawatts of electricity at full operating capacity. Council explained that this would assist in achieving the Victorian Government's renewable energy target of 25 per cent of total energy generation by 2020 and 40 per cent by 2025.

Mr Noronha and Mr Appels examined the broader employment data for the Greater Shepparton area.

Mr Noronha stated that the four solar energy facilities will deliver aggregated environmental, economic and community benefits. He provided considerable data, analysis, and a net community benefit assessment to support this statement. These benefits were reflected in the key assumptions adopted in the expert witness conference statement.

Mr Noronha estimated that the aggregate benefits of the four solar energy facilities would include 35 full time jobs from direct employment and a further 100 permanent jobs to be generated in the wider State and national economies. He achieved this figure by applying an industry-standard multiplier for the electricity industry of 3.9¹ to the direct operational and maintenance jobs, of which he said, some would be generated locally through existing and new supply chains. In summary, he estimated that approximately 135 jobs (35 direct jobs and 100 indirect jobs) can be expected to be supported on an ongoing basis through the operation of the four facilities.

Mr Appels stated that there is a diversity of industries other than agriculture in the Greater Shepparton region and that the proportion of agricultural-related employment has been declining over the past 25 years. Mr Noronha stated that the four solar energy facilities would:

- contribute to Greater Shepparton's industry transformation by providing diversification opportunities for industry and workers
- assist Greater Shepparton's current unemployment rate of 7.4 per cent compared to Victoria (6.0 per cent) and Regional Victoria (5.4 per cent).

Council was critical of Mr Noronha's figures.

Mr Noronha explained that the Tatura East facility would contribute \$50 million in capital investment, of which \$10 million would be spent on local labour and purchases. He added that it would directly employ 210 full-time equivalent positions, of which 170 are likely to be sourced locally and 335 indirect full-time equivalent positions during construction. During its operational phase, Tatura East would directly employ five full-time equivalent positions, 15 indirect positions, add \$22.4 million to the region over 30 years.

Mr Appels stated that, based on information provided to him by X-Elio, the proposed Tallygaroopna and Congupna solar energy facilities would cost approximately \$15 million to establish from sourcing equipment, workers and materials in the Shepparton area. They would generate up to 250 construction jobs and 10 to 15 ongoing jobs.

Mr Noronha was not able to calculate the aggregated reduction in carbon emission for the four projects due to information constraints.

(iv) Discussion

No submitter objected to renewable energy facilities in general, or to locating them in another part of the broader Greater Shepparton region or beyond. Some submissions, such as the Committee for Greater Shepparton, explicitly supported renewable energy.

¹ Based on Australian Bureau of Statistics Input-Output tables

Environmental

The Panel acknowledges that the four proposed solar energy facilities will comprise 849,800 solar panels, generate 243 megawatts at full operating capacity and are in a region with considerable annual direct solar exposure. This scale of renewable energy generation will contribute considerably towards the Victorian Renewable Energy Target. The Panel has no doubt that these facilities will reduce carbon emissions from electricity generation which will result in a significant positive environmental effect.

Economic

The Panel accepts the agreed propositions and key assumptions in the expert witness conference statement. The Panel highlights that the loss in agricultural production of \$700,000 to \$1.3 million each year is small when compared to:

- the region's \$2.1 billion agricultural production value (zero percent when rounded to the closest number)
- direct and indirect economic effect through capital investment and jobs during the construction and operational phases
- the additional electricity capacity available through Victoria's power grid.

The Panel accepts that the 850 full-time equivalent positions during construction and 35 direct (and potentially 100 indirect jobs in Victoria and Australia) ongoing positions will far exceed the two to four farm jobs estimated to be lost. Of the \$307 million proposed to be invested into the region, the community should expect \$51 million of it to flow through purchasers of services and labour.

Social

There was little discussion about the social effect of the proposed energy facilities. The Panel considers that some of the economic effects will translate across as social effects. For example, providing net additional job opportunities to an area with a relatively higher unemployment rate than regional Victoria generally may provide some members of the local community additional revenue to make further choices in their day-to-day activities, including social interaction. CleanGen proposes to establish a community fund of \$50,000 each year to support community groups or projects and programs such as the Council community grant fund, Aboriginal partnerships, Lighthouse projects, Women's Charter Alliance and Start-ups and innovation. Supporting this community interaction will have a notable positive social effect.

(v) Conclusions

The Panel concludes:

- Reducing carbon emissions through 243 megawatts of renewable energy will have a significant positive environmental effect.
- The four proposed solar energy facilities will contribute towards achieving the Victorian Government's renewable energy target of 25 per cent of generation by 2020 and 40 per cent by 2025.
- The four proposed solar energy facilities will have a positive economic effect on the Greater Shepparton region through, among other things:

- capital investment of \$307 million, of which an estimated \$51 million will flow to the local economy
- 850 jobs during construction and 35 ongoing jobs compared to two to four farm jobs estimated to be lost
- Some of the economic effects, such as new jobs, local expenditure and community funding, will translate into notable positive social effects.

3.5 Alignment with planning policy

(i) The issue

The issue is whether planning policies on agriculture and renewable energy conflict, and if so, whether the objectives can be integrated in favour of net community benefit and sustainable development. In addition to evidence and submissions on planning policy, this chapter considers discussion and conclusions from chapters 3.2, 3.3 and 3.4.

(ii) Evidence and submissions

Just over half of the submissions for the four permit applications objected on the basis that the facilities would be inconsistent with the primary strategic use of the land for irrigated agriculture or that it would have a detrimental impact on agricultural production in the region. Submitters were concerned that the proposed solar energy facilities would reduce productive agricultural land, which is the main driver of the region's economy.

Council submitted that the Planning Scheme planning policies which apply to the four applications are the primary policy driver for determining the permit applications.

DELWP and Council referred to parts of the State Planning Policy Framework, Victoria Planning Provisions and Hume Regional Growth Plan to highlight policy support for protecting agricultural production and for exploring renewable energy opportunities. These include Clause 14.01 (Agriculture), Clause 19.01 (Renewable Energy) and Renewable Energy Facility (Clause 52.42). Council submitted that while the Hume Regional Growth Plan seeks to support agricultural production by protecting and enhancing key agricultural assets including land and water resources (Clause 11.2), it also supports exploring opportunities for renewable energy generation (Clause 11.3).

Details of these clauses and sections are in Chapter 2 of this report and not repeated here.

Council submitted that there is a conflict between the policies seeking to protect agriculture and those which support renewable energy facilities. It considered that the primary policy issue is *"whether the loss of productive agricultural land within a food bowl of national significance for the purpose of solar farms produces an acceptable planning outcome."*

DELWP and Council submitted that, where the Planning Scheme presents potentially competing policy objectives, Clause 10.01 directs that the decision maker should:

... endeavour to integrate the range of policies ... to be determined and balance conflicting objectives in favour of net community benefit and sustainable development for the benefit of present and future generations.

X-Elio called planning evidence from Mr Glossop of Glossop Town Planning. Mr Glossop stated that it too simplistic to conclude that solar energy facilities are inappropriate or not supported by policy because they are not soil-based agriculture. He added that, while protecting farmland is an important strategic consideration, it is not a threshold consideration. The renewable energy provisions under Clauses 19.01-1 and 52.42 seek to facilitate renewable energy proposals. Therefore, they seek to facilitate solar energy facilities; not restrict them. It was his opinion that solar energy facilities are compatible with agricultural land-use.

Mr Glossop stated that net community benefit can be assessed by examining:

- whether the disbenefits of the proposed facilities outweigh the benefits
- whether the proposals result in an acceptable planning outcome.

He explained that the key question is whether the permit applications provide an appropriate planning outcome that will result in net community benefit and sustainable development.

Neoen called planning evidence from Mr Clarke of Matrix Planning. Mr Clarke stated that quantifying the relative benefits of agriculture and renewable energy to assess net community benefit is difficult and the wrong approach. He considered that planning policy supports both an agricultural use and a renewable energy facility and it is not a question of choosing one over the other. He stated that both outcomes are not mutually exclusive. In his opinion, the question is whether the proposed land-use will result in an acceptable planning outcome. He stated that there is only one land-use proposed in these applications and any alternative land-use is not relevant. Mr O'Farrell of Counsel for X-Elio and Ms Acreman of Counsel for CleanGen agreed with Mr Clarke's view on these matters.

Mr Clarke highlighted that there are very few areas with the sort of characteristics of these sites, solar access and flat topography, located on the energy grid. When questioned by Council, Mr Clarke said that land is a finite resource and it would be an unfair analysis to conclude that a specified benefit has not been achieved. It is not possible to fit every type of use on one piece of land. The question is whether there is sufficient land available for agriculture in Greater Shepparton. Mr Clarke emphasised that he was not saying that it is not about net community benefit.

In response to questions from the Panel, Mr Clarke stated he believes there are conflicting policies. He explained that the gist of his evidence is that either land-use outcome is acceptable. It does not get rid of the conflict. Mr Clarke stated that conflict is something we should manage, not shy away from, and that managing conflict means avoiding conflict by making a choice. He added that one of the things planning should not do is to try to control the market place.

Mr O'Farrell and Mr Power both submitted that Clause 19.01 requires a responsible authority to facilitate renewable energy. Mr Power added that renewable energy is emphatically and incontrovertibly supported by the Planning Scheme and in Victorian and Commonwealth renewable energy targets.

Mr Power said that if a renewable energy development is in an “*appropriate location*” the responsible authority is obliged to approve it. He added that the primary focus for assessing the planning permits should be whether:

- there are site constraints that make it unsuitable
- the project would materially compromise or undermine the achievement of planning policies that support other land-use or planning outcomes.

Mr Power submitted that, while the impact of the proposals on the agricultural sector is a relevant consideration, it is not a question of whether there is another preferred or better use for the sites. The question is whether permitting solar energy facilities would compromise agriculture in this location – he said that it does not.

Council referred to the decision guidelines in Clause 65 of the Planning Scheme, case law and VCAT decisions on the test of an acceptable planning outcome. It submitted that the Panel needs to be satisfied that the developments and conditions on the permits will produce acceptable planning outcomes, as distinct from ideal planning outcomes.

Council preferred the evidence of Mr Glossop and the agricultural and economics experts and considered Mr Clarke’s approach to net community benefit to be incorrect.

VFF submitted that, despite the expert witness statements, State, regional and local planning policy do not support non-agricultural land-use in the Farming Zone. At the Hearing, Ms Gervasoni represented VFF. Mr O’Brien of Clement Stone Town Planners represented Valley Star Pty Ltd and NMB Barolli Pty Ltd and others. Both parties opposed the four permit applications and submitted that:

- the Planning Scheme clearly identifies areas of strategic agricultural value which should be protected
- there is considerably more policy support for protecting agricultural land and water infrastructure than for renewable energy.

VFF explained that, unlike geothermal energy or wind energy, solar energy does not have major locational issues and can avoid strategic land and land with significant community infrastructure investment. Therefore, greater emphasis should be placed on the Farming Zone purpose and on local strategic planning to determine whether an alternative use is appropriate.

VFF submitted that “*facilitating large footprint industrial facilities in highly productive agricultural areas is not strategically supported and creates unnecessary conflict.*” It added that State and local planning policy have many clauses that support the protection of agricultural land from loss or from incompatible use. The policy support for agriculture is more extensive than that for renewable energy. At the Hearing, Ms Gervasoni submitted that each site is clearly identified as strategic agricultural land to be protected from loss.

VFF submitted that there is no clear State policy supporting solar power or outlining how to consider permit applications, unlike State policy supporting agriculture. In response to a question from the Panel, Ms Gervasoni said that VFF had asked the Minister to introduce solar energy facility guidelines and that local considerations are always required.

VFF said that any discretionary use in a Farming Zone should be strategically supported, provide a net community benefit and not be detrimental to agricultural production.

Mr Peter Hall described the permit proposals as a 'collision' of public policy on agriculture and renewable energy.

Mr O'Brien considered there is insufficient policy direction on how and where a solar energy facility should be located. He added that planning policy does not support such a facility, being a non-agricultural-use, on productive agricultural land.

He found Clause 52.42 decision guidelines to be too broad to weigh up whether a solar energy facility should be in a strategic agricultural area which is supported by considerable planning policy. Mr O'Brien cautioned about the need *"to prevent compounding and cumulative impacts on the future growth and consolidation of agricultural land within the region."*

(iii) Discussion

The Panel's task is to determine whether the proposed solar energy facilities will result in an acceptable planning outcome. In line with Clause 10.01 of the Planning Scheme, the Panel has considered whether the range of policies relevant to the issues have been integrated to determine and balance conflicting objectives in favour of net community benefit.

The Panel was presented with State planning policies seeking to protect productive farmland that is of strategic significance in the local or regional context (Clause 14.01-1) and promoting the provision of renewable energy with appropriate siting and design considerations (Clause 19.01-1). These are reflected in the Hume Region Clause 11.2 which recognises the region as a significant agricultural area for Victoria and nationally. It provides that agricultural production is to be supported and key agricultural assets are to be protected, including land and water resources. Clause 11.3 supports exploring opportunities for renewable energy generation to secure a sustainable energy future for the region.

There was considerable discussion at the Hearing about whether there was a conflict between relevant policy objectives. The Panel agrees with Mr Glossop's expert opinion that it is too simplistic to conclude that a solar energy facility is an inappropriate land-use because Clause 14.01 seeks to protect productive farmland. This policy needs to be considered and balanced with Clause 19.01 and Clause 52.42 which seek to facilitate renewable energy proposals.

The Panel has placed considerable weight on planning policy which seeks to protect agricultural production and water supply. It has already found that the proposed facilities will not adversely impact agricultural production or water infrastructure in the Irrigation District. A solar energy facility can co-exist with surrounding agricultural land if the proposed facility is consistent with planning policy and can achieve an acceptable outcome.

The Panel agrees with Mr Clarke that only the land-use proposed in the permit applications can be considered. Any preferred land-use thought to be better or ideal is not relevant. The Panel does not agree with submissions that planning policy does not support a solar energy facility on agricultural land because it is a non-agricultural use. The relevant question is whether a solar energy facility in an agricultural area is consistent with planning policy.

Clause 14.01-1 requires that productive agricultural land is not permanently removed from the State's agricultural base without considering its economic importance for the agricultural

production and processing sectors. The State Planning Policy for the Hume Region Clause 11.2 supports developing a more diverse regional economy but also provides that infrastructure and strategic resources such as water and agricultural land are to be protected and enhanced. There was considerable expert evidence at the Hearing to determine that the proposed facilities will not have a significant economic effect on agricultural production.

The Panel does not agree with submissions that there is insufficient policy and decision guidance to decide on the four permit applications. When assessing a permit application, a responsible authority will adjust its degree of discretion based on the extent of specific and detailed guidance. While specific guidance for a solar energy facility is limited in this instance, there are sufficient broader policy and decision guidelines to enable the Panel to recommend whether each permit should be granted.

In line with the planning experts, the Panel finds that each facility proposal is consistent with planning policies seeking to facilitate renewable energy proposals and those seeking to protect agricultural production. The four solar energy facilities can, subject to appropriate permit conditions, harmoniously achieve both agricultural and renewable energy policy objectives.

(iv) Conclusion

The Panel concludes:

- Using and developing the subject sites for solar energy facilities can, subject to appropriate permit conditions, harmoniously achieve agricultural production and renewable energy objectives sought through State and local planning policy.
- The four proposed solar energy facilities, individually and cumulatively, will not remove the extent of agricultural land that would conflict with State or local planning policy.

4 Common issues

4.1 Background

The Panel directed that solar energy and associated expert witness meet to agree on key issues in dispute and key assumptions before the Hearing. The following expert witnesses met on 11 May 2018:

- Mr Guthrie of Sustainable Energy Transformation Pty Ltd on solar energy called by Council
- Dr Doris Blaesing of RMCG on horticulture and livestock called by Council
- Dr Barron-Gafford of the University of Arizona on heat island effect called by Neoen.

Their statements are shown in the relevant sections of this chapter.

4.2 Air temperature

(i) The issue

The issue is whether a solar energy facility will change air temperatures within the perimeter and beyond the solar arrays. The terms PV array and solar array are used interchangeably throughout the submissions and documentation but both terms refer to the complete solar generating unit comprising multiple PV modules and solar panels.

(ii) Submissions

Many objectors to the four permit applications submitted that the solar energy facilities, may, or will, increase air temperature beyond the solar array. Council's Part B Submission included numerous relevant studies, including:

- Barron-Gafford G, Minor R, Allen N, Cronin A, Brooks A, Pavao-Zuckerman M, *The Photovoltaic Heat Island Effect: Larger solar power plants increase local temperatures* (Barron-Gafford et al (2016))
- Fthenakis V and Yu Y, *Analysis of the Potential for a Heat Island Effect in Large Solar Farms* Photovoltaic Specialists Conference (PVSC), 2013 (Fthenakis V and Yu (2013))
- Yang L, Gao X, Lv F, Hui X, Ma L, and Hou X, *Study on the local climatic effects of large photovoltaic solar farms in desert areas* Solar Energy 144, 244– 253, 2017 (Yang et al (2017))
- Armstrong A, Ostle N and Whitaker J, *Solar park microclimate and vegetation management effects on grassland carbon cycling*, 2016 (Armstrong et al (2016)).

A proportion of objectors referred to international research, including Barron-Gafford et al (2016), to submit that the proposed facilities would increase temperatures by three to four degrees Celsius and would adversely impact on surrounding agricultural production. Many objectors interpreted the research as stating that temperature would occur outside the solar array, some thought inside, while several objectors did not specify location.

Referring to Barron-Gafford et al (2016), NMB & J Barolli Pty Ltd, orchard property owners in Tallygaroopna, considered that the permit application did not provide an impact assessment on the Photovoltaic Heat Island Effect.

Mr Todd Hall, Mr Shane Hall and Mr Peter Hall are three Tatura East orchard owners concerned about the proposed solar energy facility increasing temperatures in the area. At the Hearing, Mr Peter Hall challenged the available science regarding temperature variation and sought a setback of greater than 50 metres. He informed the Panel that listening to the relevant expert witnesses affirmed his view that more research is needed.

A few objectors submitted that their energy bills would increase because they would have to cool their dwelling more often.

There were objectors who submitted that an increase in air temperature would increase the insect population, adversely impact birds, horticulture and livestock. These subsequent matters are discussed in Chapter 4.4.

Council submitted that, in response to potential heat island effect, it applied the precautionary principle when including the following generic condition on each draft permit:

A setback of the solar farm arrays of not less than 50 metres to property boundaries

Council referred to several VCAT and Supreme Court cases regarding the application of the precautionary principle, including *Western Water v Rozen & Anor (2008) 24 VR 133*. This matter related to the restricting one dwelling to every 40 hectares in open drinking water catchment areas.

Ms Acreman submitted that there two pre-conditions to applying the precautionary principle:

- (a) *There must be scientific uncertainty*
- (b) *There must be a threat of serious or irreversible damage.*

With *Rozen*, Ms Acreman said that it was scientifically plausible that septic run off entering the drinking water system would cause serious health damage. However, there was scientific uncertainty about how many septic tanks should be permitted in the catchment.

Ms Acreman said that the situation with solar energy facilities is different. There are relevant experts, including those who appeared as expert witnesses who agree with the science that there is no risk of serious harm. She added:

Lack of scientific certainty is not enough. We could posit that the solar panels will turn the fruit in the orchard blue and that because we don't have scientific proof that will not happen, we should not place solar panels near an orchard. Fruit turning blue will no doubt be serious harm. But, is there actually a risk of it happening? Is it plausible to say the fruit will turn blue? We could do a couple of preliminary tests to find out and if those tests couldn't find a plausible basis for the assertion that the solar panels would cause the harm complained of, we would not go further.

In response to questions from the Panel regarding more detailed reasons about the setback and its spatial impact, Council provided a table (reproduced in Table 1) highlighting the extent of land required to meet the 50-metre setback.

Table 1 Spatial impact of proposed 50-metre setback on each subject land

Subject land	Total land area (Ha)	Land perimeter distance (m)	Buffer area (m ²)	Buffer area (km ²)	Buffer area (Ha)	% of total land affected by buffer
610 Ferguson Road, Tatura East*	135.86	5,200	202,159.84	0.20	20.22	14.88
1090 Lemnos North Road, Congupna	161.81	5,081	244,453.26	0.24	24.45	15.11
235 Victoria Road, Tallygaroopna	96.30	4,463	212,871.46	0.21	21.29	22.11
1220 Cosgrove-Lemnos Road, Lemnos	450.78	11,427	536,264.61	0.54	53.63	12.56

*Note that the total land area is 135.86Ha and the total solar energy facility land area is 98.12Ha. CleanGen disputed use of the land area of 135.86Ha rather than 98.12Ha calculating the percentage of land impacted. Use of the 98.12Ha would mean 20.59 percent of the land would be impacted. Irrespective, the total land area of the Council's generic 50-metre setback would be 119.59Ha.

During the Hearing, Council said that Mr Harriott, Chief Executive Officer, Greater Shepparton City Council, originally proposed the 50-metre setback permit condition. Council tabled his written reasons (Document 38) and acknowledged that he didn't have the benefit of multiple expert witnesses, expert conferences or cross-examination when he originally proposed the setback. Regarding Mr Guthrie's presentation to Council in January 2018, Mr Harriott explained:

In his presentation, he recommended a buffer distance of 25m to protect against heat impacts on adjoining landowners. At the meeting, I recall raising with Ken that Council was considering a buffer distance of 50m. I recall Ken responding to the effect that, a 50m buffer distance is not what his research found to be required, but that it would not be an unreasonable buffer distance if Council wanted to take a cautious approach.

...

I didn't have before me enough scientific evidence to be confident that these heat impacts wouldn't occur, so I took a cautious approach.

...

I applied the 50m setback to all four of the application sites because the same scientific uncertainty applies to each of them. They all adjoin land that needs to be protected.

(iii) Evidence

The expert witness statements of Dr Barron-Gafford and Mr Guthrie referred to Barron-Gafford et al (2016) and Fthenakis and Yu (2013). Mr Guthrie stated:

These two papers indicate that temperatures within the solar farm will be higher than in the surrounding areas for at least part of the time. Whether that constitutes a "Heat Island" depends on whether the definition used requires it to be at an elevated temperature all the time or on average. However, Fthenakis and Yu also indicate that the PV farms also exhibits another of the characteristics of a heat island, which is the temperature "cliffs" at the fringe of the PV farm where temperatures drop quickly into the surrounding area.

Having considered Yang et al (2017), Mr Guthrie stated:

Based on these three papers it is my view that there will be an elevated temperature within the PV farm compared to the same site in current use and that the increased temperature will be of the range:

- *In winter, night-time air temperatures above the panels will be 0.2 – 3.0 °C above temperatures outside the PV farm,*
- *In summer, temperatures will be 0.1 – 4 °C higher above the panels than outside the PV field and:*
- *In the soil under the PV panels, temperatures are cooler during the day and warmer at night, than outside the PV field.*

Mr Guthrie noted that these type of temperature changes are often encountered with changes in land-use. For example, de Vries and Birch (1961)² observed a temperature difference of one to two degrees Celsius at 1.25 metres above the ground in irrigated areas compared to dryland in the area near Rochester, approximately 75 kilometres west of Shepparton.

Mr Guthrie explained:

Whilst decreasing heat build-up will be important to the operator of the solar farm, as PV output reduces as temperature of the panels increase, for neighbours the major issue will be to reduce the potential for heat transmission out of the solar farm into neighbouring properties.

Referring to his own research in Barron-Gafford et al (2016), Dr Barron-Gafford stated in his evidence:

Ultimately, we found that air temperatures within a PV solar farm are higher than those in nearby natural settings, and we referred to this as the PVHI effect (Figure 2). We found the PVHI effect to be much greater within the solar farm at night, with the greatest impacts being within the spring and summer months. Additionally, we found that presence of a PVHI effect to be much less significant during the day, and that the effects were least prominent in the winter and fall, regardless of time of day.

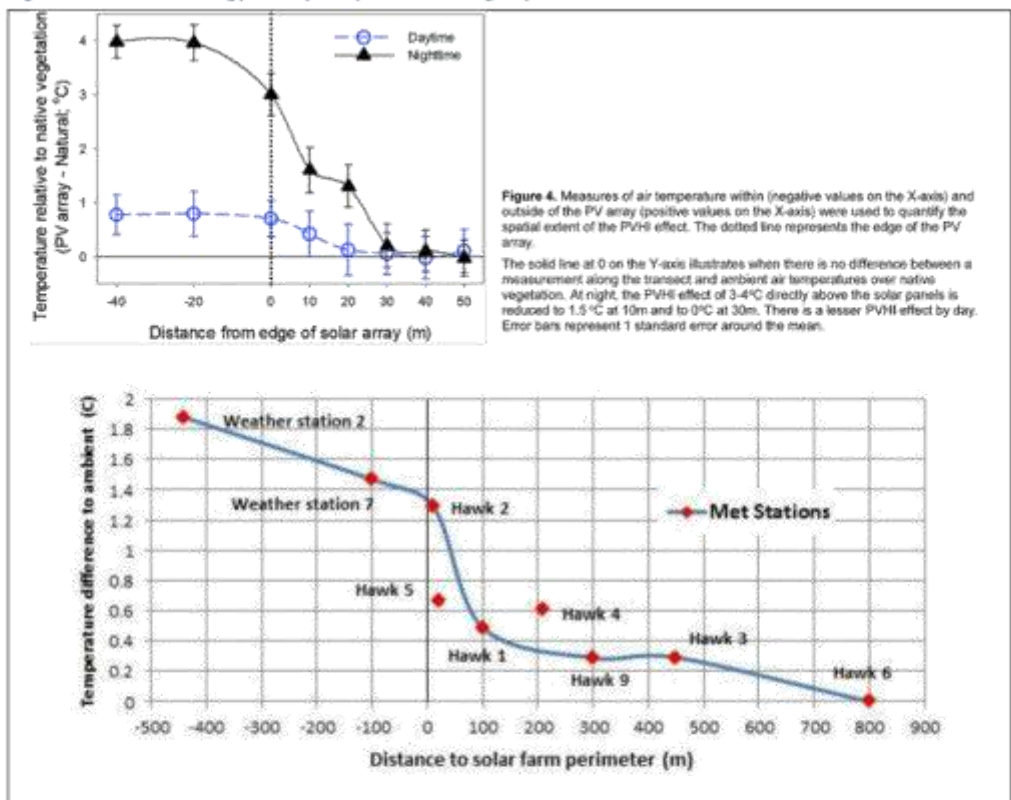
² The modification of climate near the ground by irrigation for pastures on the riverine plain" Vries D A de and J W Birch 1961 Australian Journal of Agricultural Research 12(2) 260 – 272.

Mr Guthrie and Dr Barron-Gafford each stated that these temperatures dissipate quickly with height above the solar panels as the thermal energy radiates back towards the atmosphere. Fthenakis and Yu (2013) states:

These simulations show a profound cooling effect with increasing height from the ground. It is shown that temperatures on the back surface of solar panels is up to 30 °C warmer than ambient temperature, but the air above the arrays is only up to 2.5 °C higher than ambient.

There were conflicting temperature dissipation results between Barron-Gafford et al (2016) and Fthenakis and Yu (2013), with the former showing results that any spatial extent of the PVHI has completely dissipated at 30 metres. The evidence statements of Dr Barron-Gafford's and Mr Guthrie critiqued the Fthenakis and Yu (2013) figure (see Figure 7) which showed the PVHI completely dissipated at 800 metres.

Figure 7 Solar energy facility temperature change by distance



Sources: Left: Dr Barron-Gafford's statement (Figure 4) Right: Fthenakis and Yu (2013) Figure 8 which appears in the statements of Mr Guthrie and Dr Barron-Gafford

The research publication of Barron-Gafford et al (2016) was peer reviewed and published in a journal with a high impact factor³ while Fthenakis and Yu (2013) was not peer reviewed or published as conference proceedings, which generally are not allocated an impact factor.

Regarding Fthenakis and Yu (2013), Dr Barron-Gafford questioned the accuracy of the sensors used because the accuracy of the Hawk weather station air temperature probe is only around 0.5 degrees Celsius. No data on the uncertainty or variation was presented. Dr Barron-Gafford considered that, if this uncertainty is considered, all measures of air temperature beyond 200 metres may be indistinguishable from ambient air temperatures. He interpreted that the 'Hawk 4' reading is a singular measure that is anomalously higher than those around it, which are on a downward trend when moving away from the array. Dr Barron-Gafford stated that measures of uncertainty which are normally associated with such studies were not applied on any of these measurements. He was concerned about an apparent lack of cross-calibration within the Hawk sensors. Fthenakis and Yu (2013) identified the following issue:

'Hawk 7' shows higher temperatures likely due to a calibration inaccuracy.

The data from 'Hawk 7' is not shown in Figure 8 or Table 1 of Fthenakis and Yu (2013). The data in Table 1 of that Study shows that the temperature difference decreases by approximately 50 per cent when moving from 'Hawk 2' at 10 metres separation to 'Hawk 5' at 20 metres separation.

All parties to the Hearing, including members of the local community, had the opportunity to cross-examine all expert witnesses. Several parties, who referred to Barron-Gafford et al (2016) in their submissions, thoroughly cross-examined him on the study findings and his expert witness statement. Dr Barron-Gafford affirmed the evidence in his written report that there will be negligible differences in air temperatures at distances greater than 30 metres from the perimeter of the solar arrays.

There were objecting parties which continued to express concern about how increasing temperature would affect their property after hearing contradictory expert evidence. At the Hearing, Council submitted:

Council has filed and served expert evidence from Mr Guthrie. Mr Guthrie's descriptions are sound and reasonably based and he is a respected expert in his field. Council does not adopt Mr Guthrie's opinion that a 50 metre setback is not required.

(iv) Discussion

Within the solar array permitter

The Panel accepts expert evidence of Mr Guthrie and the expert evidence of Dr Barron-Gafford and the expert conference statement regarding the scientific consensus that solar

³ The impact factor (IF) or journal impact factor (JIF) of an academic journal is a measure reflecting the yearly average number of citations to recent articles published in that journal. It is frequently used as a proxy for the relative importance of a journal within its field; journals with higher impact factors are often deemed to be more important than those with lower ones.

arrays will affect air and soil temperatures within the solar array perimeter. Air temperature within the perimeter of a solar array is expected to increase three to four degrees Celsius compared to outside the solar array. However, the temperature quickly reduces with height and can be managed. Decreasing heat build-up will be important to the operator of the solar arrays – as solar output reduces, the solar panel temperature increases. Compared to outside of the solar array, soil temperatures within the perimeter of a solar array are cooler during the day due to shading by the panels and warmer at night due to energy being trapped below the panels.

While there are only several studies related to the spatial extent of the PVHI, they are sufficient to understand the degree of temperature variation resulting from the technology proposed in the four permit applications.

Outside the solar array perimeter

The Panel gave considerable weight to Dr Barron-Gafford's evidence and it accepts the results of the Barron-Gafford study related to the extent of any PVHI effect which states:

... that the PVHI was indistinguishable from air temperatures over native vegetation when measured at a distance of 30 m from the edge of the PV array. This pattern held true for both daytime and night-time conditions. Because the PV panels themselves trap the energy from diffuse sunlight that was able to reach the ground underneath them, air temperatures remain elevated within a PV array. As you leave this "overstory" of PV panels, energy is able to radiate back towards the atmosphere, as it does in a natural setting, and the PVHI quickly dissipates.

The temperature variation shown in Fthenakis and Yu (2013) for the first 100 metres either side of the edge of the solar array is broadly consistent with those observed by Dr Barron-Gafford in Figure 4 of his evidence statement. The Panel was not presented with any credible evidence to oppose the findings of Fthenakis and Yu (2013) which states:

Analyses of 18 months of detailed data showed that in most days, the solar array was completely cooled at night, and thus, it is unlikely that a heat island effect could occur.

There is scientific consensus that a 'heat island effect' is unlikely to occur, therefore the precautionary principle does not apply for any of the proposed four solar energy facilities. This is supported by expert consensus that a serious or irreversible effect will not occur. Council's proposed generic 50-metre setback is therefore not required to address temperature, is considered excessive, and is not based on any evidence. As outlined in Mr Harriott's explanation, Mr Guthrie's recommended 25-metre setback "to protect against heat impacts on adjoining landowners".

The Panel is concerned about two matters – Figure 8 from Fthenakis and Yu (2013) and the disconnect between what Council asked Mr Guthrie in early 2018 about setbacks and what ultimately appeared in the draft planning permits.

As identified by Dr Barron-Gafford, Fthenakis and Yu (2013) acknowledges that Hawk 7 show higher temperatures likely due to calibration inaccuracy. Fthenakis and Yu (2013) opted to exclude Hawk 7 and relied on other testing stations to profile heat impacts. However,

calibration inaccuracy on one station is likely to have a sequential effect across other stations such as Hawk 4. Unlike other studies, Figure 8 does not adopt any measures of uncertainty. While Fthenakis and Yu (2013) provides considerable science and insight, Figure 8 should not be relied on to understand temperature impact resulting from a solar energy facility. There were several parties which relied on this information to support their submissions.

This takes the Panel to its next concern – the disconnect between what Council asked Mr Guthrie in early 2018 and what ultimately appeared in the draft planning permits. Mr Guthrie stated that a 25-metre setback from adjoining property boundaries provides sufficient protection and Council asked whether it would be reasonable to extend this to 50 metres. However, the proposed permit condition requires a 50-metre setback between the solar arrays and subject land property boundaries. A considerable proportion of subject land boundaries interface with 20-metre road reservations, therefore this would result in a 70-metre separation between solar arrays and many adjoining property boundaries.

The Panel considers that a 30-metre setback should be applied from the external edge of a solar array to the closest adjoining property boundary, which is broadly consistent with the science and Mr Guthrie's original advice to Council. To minimise the land impacted by the 30-metre setback, the Panel considers existing road reservations, irrigation channels and existing vegetation can be included within the 30-metre setback. Later chapters consider how and where this should apply for each solar energy facility.

The Panel acknowledges the angst that the potential for temperature increases beyond the subject land areas had on surrounding residents and farm operators. In many instances, research referred to in submissions and at the Hearing, appeared to be not clearly understood, misrepresented and in some cases, unreliable. For example, Barron-Gafford et al (2016) stated that the temperature would increase by three to four degrees Celsius *within* the solar array; not beyond.

Surrounding farm operators should be comforted that the so-called 'heat island' effect was not a threat and will not adversely impact surrounding farm operations.

(v) Conclusions

The Panel concludes:

- While limited, there is sufficient scientific evidence to determine that no proposed solar energy facility will increase temperature beyond 30 metres of a solar array.
- The precautionary principle therefore does not apply and Council's proposed generic 50-metre setback is not required to address temperature.
- Any temperature increase within the solar array will be marginal, however, any solar array should be separated 30 metres from any neighbouring property boundary.

4.3 Soil and ground water temperature

(i) The issue

The issue is whether a solar energy facility will change soil and ground water temperature.

(ii) Submissions

Many objectors to the four permit applications related to soil temperatures and ground water. Mr and Ms Slorach submitted that the solar panels “*reflect and absorb upwelling long wave radiation which can prevent the soil from cooling as much as it otherwise would at night, in turn increasing the ambient air temperatures.*” Ms Cobbledick submitted that there was insufficient research to understand the impact on soil temperature.

Regarding in-ground temperature increases, Council referred to Armstrong et al (2016) and Yang et al (2017). Armstrong et al (2016) reported:

From spring to autumn, soil at a depth of 10 cm under the solar arrays was significantly cooler (up to 5.2°C daily average) and during autumn and winter the soil in the gap was, on average 1.7°C cooler compared to control and gap treatments.

Yang et al (2017) reported:

The average annual soil temperatures at depths of 5 – 180 cm (5, 10, 20, 40, 80 and 180 cm) under the PV array were around 2°C cooler than an area without a solar array.

Based on Figure 6 of Yang et al (2017) there is no apparent effect on soil temperature at depths of 40, 80 and 180 cm.

(iii) Discussion and conclusion

The Panel reviewed relevant studies provided by Council and agrees with their outcomes that no apparent effect should be expected on soil temperature at the specified depths. Accordingly, ground water will not be affected.

The Panel concludes that the solar arrays will not increase soil and ground water temperature.

4.4 Effect on horticulture, livestock and insects

(i) The issue

The issue is whether each solar energy facility will have an adverse effect on neighbouring orchards, horticulture, farming for cattle and livestock and insects.

(ii) Expert witness conference statement

The relevant experts generally agreed:

Environmental (especially climate) context factors are important with regard to the extent of mitigation these treatments will provide; however, all agree

that these potential treatments of a vegetative buffer or revegetating the site between and or below arrays will mitigate any negative impacts on the external environment, including all agriculture/horticulture activities.

There would be no increase of orchard 'pest' insects as these insects are attracted by fruit and are not attracted by solar panels. The vicinity of a solar farm would have no impact on temperature sensitive insects such as fruit fly i.e. would not support survival.

There is more than sufficient research relating to mitigating the impacts of the substantial Urban Heat Island effect by intentional plantings (trees, shrubs, grassed areas) to realistically conclude that conducting either potential treatments of a vegetative buffer or revegetating the site would ensure that a solar farm with a substantially lower heat island above it would have no negative impact on nearby agricultural uses.

Other comments:

Doris Blaesing suggested that even if there was an external temperature impact of 1 degree in the immediate vicinity of the solar farm arrays, it would be unlikely to have any impact on fruit production (chilling). Recent climate change modelling for the Shepparton region shows no impact at an increased temperature of 1-2 degrees. It is further noted that the heat island impact of the city of Shepparton would likely be far more significant for nearby orchards than a solar farm. There was no disagreement to this suggestion.

(iii) Evidence

Dr Blaesing based her views on Mr Guthrie's preliminary opinion about the potential heat island effect of solar energy facilities. She stated:

Even if the proposed solar farm installations increased daytime air temperatures by 0.5 to 1.0 °C in a small proportion of a paddock during the middle part of the day, good grazing and herd management means that animals never spend extended time in the same paddock. Also, cattle instinctively move to sheltered and cooler areas of a paddock during adverse conditions.

Dr Blaesing referenced a study by Turney and Fthenakis⁴ which identified and appraised 32 impacts related to the installation and operation phases of large-scale solar energy facilities in the U.S. They investigated the themes of land-use intensity, human health and well-being, plant and animal life, geohydrological resources, and climate change. Their appraisals assumed that electricity generated by new solar power facilities would displace electricity from traditional U.S. generation technologies. Altogether, they found 22 of the considered 32 impacts to be beneficial. Of the remaining 10 impacts, four were neutral, and six required further research before they could be appraised. None of the impacts were

⁴ Turney D. and Fthenakis V. (2011) Environmental impacts from the installation and operation of large-scale solar power plants. *Renewable and Sustainable Energy Reviews* 15 (2011) 3261–3270.

negative relative to traditional power generation. The authors ranked the impacts in terms of priority and found all the high-priority impacts to be beneficial.

Mr O'Callaghan raised a concern that native birds will be scorched, injured or killed when flying over the proposed development area. In her expert evidence, Dr Blaesing stated:

German studies found that solar farm structures provided nesting sites for birds, especially compared to farmland; even smaller birds of prey were observed hunting amongst structures.

Council's Part B Submission contains an extract of the European Commission DG Environment "Science for Environment Policy" Issue 479 of 15 December 2016 states:

There has been a large increase in solar parks around the world, which has led to significant land-use change. In Europe, they are mostly placed on farmland and grassland and, in 2013, an estimated 204–1019 km² of European land was converted for ground-mounted solar photovoltaic (PV) panels. Solar PV panels have the greatest potential for generating power among all sources of renewable energy and the growth in solar parks is expected to continue.

The European Commission publication referred to previously was based upon a study by Armstrong, Ostle & Whitaker (2016)⁵. The study's authors concluded:

Solar parks contribute to the fight against climate change by displacing fossil fuels. However, increased understanding of other environmental costs and benefits will enable any negative impacts [within the solar farm] to be minimised whilst ecosystem benefits are maximised.

The Panel was not presented with evidence to demonstrate harm on land or agricultural activities surrounding a solar energy facility in Australia or overseas.

(iv) Submissions

Thirty-five objections to the four permit applications related to the impact that increased ambient air and soil temperatures this would have on horticulture, livestock, insects, birds and operating costs. Seven objections related to animal health.

At the Hearing, Mr Peter Hall and Mr Barolli explained the importance of temperature for orchard production. Like a few other objectors, they explained that sufficient accumulated chilling units of cold weather was required for orchard growth and production. Mr Hall presented two different coloured apples to demonstrate what may happen if his orchards were not sufficiently chilled overnight.

Many surrounding property owners submitted that, should the temperature increase, it would introduce more insects into the area and affect agricultural production.

⁵ Armstrong, A., Ostle, N.J. & Whitaker, J. (2016). Solar park microclimate and vegetation management effects on grassland carbon cycling. *Environmental Research Letters*, 11 (7): 074016. DOI:10.1088/1748-9326/11/7/074016.

(v) Discussion

The Panel has already found that there is sufficient scientific evidence to determine that no proposed solar energy facility will increase temperature beyond 30 metres.

The Panel accepts expert evidence of Dr Doris Blaesing and the expert conference statement with respect to the effect of the solar arrays on the issues above. It notes the scientific consensus that solar arrays will affect air and soil temperatures *within* the perimeter of a solar array. Air temperature within the perimeter of a solar array is expected to increase three to four degrees Celsius compared to outside the solar array. However, the temperature quickly reduces with height and can be managed. Decreasing heat build-up will be important to the operator of the solar arrays – as solar output reduces, the panel temperature increases. Compared to outside of the solar array, soil temperatures within the perimeter of a solar array are cooler during the day due to shading by the panels and warmer at night due to energy being trapped below the panels. There is no identified impact on ground water.

The Panel accepts expert evidence that temperature beyond 30 metres from the solar array is unlikely to increase. Neighbouring orchards, horticulture, farming for cattle and livestock, and insect population numbers will therefore not be adversely impacted.

(vi) Conclusions

The Panel concludes:

- Within the perimeter of a solar array:
 - the solar arrays will have a manageable effect on air and soil temperatures
 - compared to outside of the solar array, soil temperatures will be cooler during the day and warmer at night
 - there will be no impact on ground water.
- Neighbouring orchards, horticulture, farming for cattle and livestock, and insect population numbers will not be adversely impacted because temperature is unlikely to increase beyond 30-metres from the solar array.

4.5 Solar panel night tilt position**(i) Background**

Condition 3 of the draft Congupna, Tallygaroopna and Tatura East planning permits require a section 173 which must include:

The photovoltaic arrays (solar panels) must be orientated so that the panels are perpendicular to the ground within 30 minutes of sunset until within 30 minutes of sunrise to facilitate night radiant cooling.

Council's Part B Submission revised this requirement to specify that the solar panels are "60 to 70° from the vertical."

(ii) The issue

The issues are:

- whether adjustable solar panels should be tilted at night

- whether an angle should be specified in the permit if it is concluded that the panels should be tilted at night.

(iii) Expert witness conference statement

The relevant experts generally agreed:

Solar Panels should be tilted at a maximum tilt at night to allow for night time cooling.

There should be no requirement for a full vertical tilting at night. This will have limited difference over a maximum tilt which for commonly used trackers is a maximum of 45-60 degrees.

If the above treatments were included within any solar farm, the solar farm would be unlikely to create any external temperature impacts.

(iv) Evidence and submissions

Mr Guthrie and Dr Barron-Gafford agreed that night solar panel tilting is an important mechanism to increase the night cooling effect. While each situation of pitch, panel array width and array height will give varying results; the greater tilt of panel allows for a greater surface area of ground from which to radiate excess heat. Common solar panel trackers do not tilt to vertical and generally have a maximum tilt of 45 to 60 degrees. Both experts agreed that a full vertical tilt was unnecessary and would have limited impact over the maximum tilt used by common trackers.

X-Elio did not accept that a condition is required for night tilting, however, it would not oppose specifying 50 degrees because the solar panels at the proposed Tallygaroopna and Congupna facilities will be able to achieve this.

(v) Discussion

The Panel accepts expert evidence of Mr Guthrie and the expert evidence of Dr Barron-Gafford and the expert conference statement regarding solar panels being tilted at night to facilitate heat escape from within the solar energy facility. This is to assist the facility's operation and is not intended to address potential on-site or off-site impacts.

The Panel agrees with submissions that specifying an angle is not justified because the specifications for the four permit applications are not yet finalised. Importantly, such a numerical specification for the night-time tilt would exclude fixed array panels and therefore would not be technology-neutral.

(vi) Conclusions

The Panel concludes:

- Solar panels do not need to be tilted at night to address potential on-site or off-site impacts and therefore do not need any associated permit condition or requirement in a section 173 agreement.
- There may be operational reasons to tilt solar panels at night, however, each solar energy facility operator is best placed to decide when and how this should occur.

4.6 Glare and glint

(i) The issue

The issue is whether the solar panels will generate unacceptable glare and glint on neighbouring land.

(ii) Evidence and submissions

There were 25 objections across the four permit applications which related to glare and glint and light spill. In his expert evidence, Mr Guthrie stated:

In general, modern PV panels are designed to absorb as much sunlight as possible to convert it into electricity. Studies of PV modules with anti-reflective coating indicate they reflect around 2 per cent of incoming sunlight. The panels are single axis tracking aligned North/South. Consequently, they rotate from facing toward the East in the morning across the sky to facing West at sunset. Under the proposals, the maximum tilt of the panels is 60 degrees. This would not allow reflection onto neighbouring properties under normal operating conditions, as when the sun is at the lowest point any light reflected would be upwards.

Dr Barron-Gafford supported this conclusion during his presentation to the Panel.

This opinion is supported by CleanGen's submission. X-Elio and Neoen said that they were not aware of any issues related to glare and glint.

Council's Part A submission supported Mr Guthrie's evidence and added:

Surrounding and screening vegetation would disrupt any light rays parallel to the ground from the collector or supporting infrastructure. The materials and colour of onsite infrastructure (other than the solar panels) will be non-reflective.

Mr and Ms Ritter referred to glare and glint from the Solar One facility in Nevada and commentary from the Civil Aviation Safety Authority stating "there is nowhere in the world that a solar farm of this sort of scale has been built directly under the arrival paths into an airport at this proximity."

Mr Slorach raised concern about glare and submitted screen captures from the James Bond movie 'Spectre' which showed a solar energy facility with such glare.

(iii) Discussion

The Panel accepts the expert evidence of Mr Guthrie that the solar panels in the four proposals will have anti-reflective coating and that the panels will only reflect around two per cent of incoming sunlight. The panels are single axis tracking aligned North/South. Consequently, they rotate from facing towards the East in the morning across the sky to facing West at sunset. Under the proposals, the maximum tilt of the panels is 60 degrees. This would not allow reflection onto neighbouring properties under normal operating conditions, as when the sun is at the lowest point any light reflected would be upwards.

Regarding concern about the glare and glint from the Nevada Solar One facility, the Solar One facility uses mirror technology which is very different to what is proposed for the four permit applications. The Solar One facility tracks the sun's location and concentrates its rays during peak demand hours. The plant uses 760 parabolic trough concentrators with more than 182,000 mirrors that concentrate the sun's rays onto more than 18,240 receiver tubes placed at the focal axis of the troughs and containing a heat transfer fluid (solar receivers). Fluid that heats up to 391 degrees Celsius flows through these tubes and is used to produce steam that drives a steam turbine, which is connected to a generator to produce electricity.

Regarding the screens from the James Bond movie 'Spectre', the movie featured Gara de Medouar in Morocco, the scenes showing the solar panels were clearly shot elsewhere, as according to Google Earth, there are no solar panels located at Gara Medouar. The solar panels in the background of the movie are probably computer-generated representations of some futuristic theme to fit with the movie.

The Panel is satisfied that the solar panels proposed for each solar energy facility will not generate unacceptable glare and glint on neighbouring vantage points.

(iv) Conclusion

The Panel concludes that the proposed solar energy facilities will not generate unacceptable glare and glint on neighbouring land and therefore do not need any associated permit condition.

4.7 Noise, light and other potential amenity impacts

(i) Background

The draft permits propose Civil Construction Plans which include requirements on lighting and car parking and it proposes the following General Amenity condition:

The use and development permitted by this permit must not, in the opinion of the responsible authority, adversely affect the amenity of the locality by reason of the processes carried on; the transportation of materials, goods or commodities to or from the subject land; the appearance of any buildings, works or materials; the emission of noise, artificial light, vibration, smell, fumes, smoke, vapour, steam, soot, ash, dust, waste water, waste products, grit, or oil; the presence of vermin, or otherwise.

Prior to the use commencing any security alarm installed on the premises must be 'silently wired' to a security firm or the Victoria Police.

Prior to the use commencing any lighting within the site must be designed, baffled and located in such positions so as to effectively illuminate all pertinent public areas, without spilling onto the road reserve or adjoining land, and must be connected to a time clock switch or other approved system to the satisfaction of the responsible authority.

Condition 3 of the draft Congupna, Tallygaroopna and Tatura East planning permits require a section 173 which must include:

The operator of the solar farm accepts and acknowledges that the solar farm operations may be subject to disturbance from agricultural activities including but not limited to spray drift, dust emissions and heavy vehicle use.

(ii) The issue

The issue is whether the proposals will result in unacceptable noise, light spill and other potential amenity impacts.

(iii) Submissions

There were 19 objections across the four permit applications relating to noise. Of those, 13 related to the Tatura East proposal and six for Lemnos. One objector submitted that cattle required quiet aesthetics usually associated with primary production land to breed successfully.

Council's Part A submission stated:

Based on similar proposals, the noise levels from typical solar farm operations are expected to be minimal and compliant with noise standards.

Solar PV tracking moves at an unobtrusive and slow rate, producing minimal noise. Solar PV farms are generally very silent during the operational phase. The only noise emitted from an operational solar farm would be from the substation and inverters, which can be inaudible if appropriate buffer distances to sensitive receivers or equipment housing are used. There is no noise from inverters at night due to daytime operation of solar panels.

During plant operations, other minor sources of noise would be from a small number of vehicles accessing the site per day, aeolian and/or corona noise from transmission lines and any intermittent noise from maintenance activities.

CleanGen sought to delete the first two paragraphs of that condition and introduce new noise conditions that require compliance with:

- Environment Protection Authority (EPA) Publication 1411 Noise from Industry in Regional Victoria, 2011 for the operational phase
- EPA Publication 1254, Noise Control Guidelines for the construction and decommissioning phases.

CleanGen also proposed an Environmental Management Plan which covers matters ranging from flood management and measures to minimise noise during the construction phase to day-to-day management during use of the facility, flora and fauna management, weed management and waste management.

X-Elio sought to amend the General Amenity condition by removing the words "*in the opinion of the responsible authority*" and adding a requirement that the permitted development not "*have an unreasonable adverse effect*" on the local amenity.

Neoen sought to replace the first paragraph of the General Amenity condition with the following requirement for an Environmental Management Plan:

Prior to the use commencing, an Environmental Management Plan must be prepared, approved and implemented to the satisfaction of the responsible authority. The Environmental Management Plan must include:

- a) overall environmental objectives for the operation of the solar farm and techniques for their achievement;*
- b) day-to-day management requirements for the use;*
- c) procedures to ensure that no significant adverse environmental impacts occur as a result of the use;*
- d) identification of possible risks of operational failure and response measures to be implemented; and*
- e) a program for recording and reporting environmental incidents or non-compliances with this permit and for responding to complaints during operation of the solar farm.*

CleanGen and X-Elio sought to change the requirement in Condition 4 about lighting design and baffling because it repeats the substantive requirements for lighting in the clause on General Amenity.

At the Hearing, Council submitted that it did not object to wording changes which do not change intent.

To address reverse amenity issues, Council submitted that the section 173 agreement, to be required by all four planning permits, should require each solar energy facility operator to accept and acknowledge the potential of disturbance from farming activities. It submitted that this is appropriate because the solar energy facility is operating in a Farming Zone, which may be affected by neighbouring as-of-right agricultural activities. It stated that these types of agreements are commonly used in situations where a new use is introduced into an area with land-use conflict potential.

Neoen and CleanGen did not support clause. CleanGen said there is no evidence of off-site impacts. X-Elio acknowledged there may be potential disturbance from agricultural activities, but it did not understand the purpose of the clause.

(iv) Discussion

The Panel accepts Council's submission that, based on similar proposals, the noise levels from typical solar energy facility operations are expected to be minimal and compliant with noise standards. Noise can be managed within the existing EPA guidelines and as part of the Construction Management Plan for the construction phase. The Panel supports a permit condition which requires each solar energy facility to comply with recommended levels set out in relevant EPA publications for the construction and operational phases. However, the relevant guidelines should not be duplicated in any planning permit. The Panel considers that noise and illumination conditions are appropriate as part of the Civil Construction Requirements.

The Panel considers CleanGen's proposal for an Environmental Management Plan to replace the first paragraph of the General Amenity clause duplicates matters that are separately regulated such as flood management and hazardous materials. It also requires plans on matters such as weed management and flora and fauna management, that are not justified.

The Panel prefers Neoen's proposed Environmental Management Plan because it is more targeted to relevant matters of environmental risk, and provides a framework to define environmental objectives. It also provides for the operator to manage risks, record complaints and manage responses.

The Panel agrees with CleanGen and Neoen that the first two paragraphs of the General Amenity clause are not ideal. The requirements are too uncertain, and there is no framework for enforcing them. Neoen's proposed condition on an Environmental Management Plan more effectively achieves the same outcome as the first paragraph of that clause.

The Panel prefers that the substantive noise and lighting requirements are set out in the Civil Construction Requirements because it provides a framework to ensure the desired outcomes are achieved.

Regarding reverse amenity, the Panel acknowledges that there is potential for spray drift or dust emission on the solar energy facilities from surrounding farming operations. The "accept and acknowledge" statement proposed to be included in a section 173 agreement would not remove the ability for a property owner or tenant to complain about surrounding farming activities. It would be inappropriate to include an unenforceable statement that incorrectly presents otherwise.

(v) Conclusions

The Panel concludes:

- Solar energy facilities are expected to comply with relevant Environment Protection Authority noise guidelines.
- A permit condition which references the *EPA Publication 1411 Noise from Industry in Regional Victoria, 2011* for the operational phase and *EPA Publication 1254, Noise Control Guidelines, 2011* for the construction phase would clarify which guidelines need to be met.
- The Neoen proposed Environmental Management Plan with specified outcomes, approved and implemented to the satisfaction of the responsible authority, is more targeted to environmental matters than the first paragraph of the General Amenity clause. Accordingly, the first paragraph under 7 General Amenity.
- The lighting and noise conditions in the second and third paragraphs of the General Amenity clause should be replaced with appropriate clauses in the Civil Construction Requirements to avoid duplication.
- The statement proposed in a future section 173 agreement requiring the facility operator to accept and acknowledging surrounding farming disturbance is unenforceable and should be deleted.

4.8 Visual impact

(i) The issue

The issue is whether the proposed solar energy facilities will have an unacceptable effect on the existing rural landscape, and if so, what response is required. Any discussion in this chapter regarding setbacks and vegetation screening does not relate to temperature or potential impact on surrounding farms. The Panel has already found that vegetation screening is not required to address any temperature matter.

(ii) Evidence and submissions

Buildings and solar arrays

Several submitters raised concerns about the visual impact of the facilities and supported a vegetative landscape screen to protect rural amenity, and the views from neighbouring properties.

Council submitted that the sites are all very flat landscapes so *“there are no significant landscape values that are particularly prominent and visible.”* It added that the solar panels are about three metres above the surface, which means they will not be dominant in the landscape.

Council submitted that this is consistent with Mr Glossop’s observation that the terrain is not elevated so the sites will not be conspicuous when viewed from a distance. Mr Glossop stated that the proposal will not result in a significant visual impact because the solar energy facilities are proposed to be screened by vegetation.

The Council officers’ proposed permit condition requires the preparation of a Landscape Plan which includes:

...

- c) *how the land under the solar arrays maintains good ground cover at a reasonable level and management of the ground cover in the fire season*
- d) *details of permanent screening trees and shrubs with a minimum of six rows using a mixture of local trees and understory species ...*

All species selected must be to the satisfaction of the responsible authority.

Council submitted that, while the purpose of the vegetative buffer is to mitigate the potential heat island effect, a landscaped buffer provides the additional benefit of visual corridors and sightlines.

Mr Guthrie supported a vegetation screen and expressed the view that the condition should specify a height requirement of taller than three metres once the plants are grown. He considered that the permit condition should also require vegetation screen to be planted and maintained along all boundaries of the solar energy facility.

At the Hearing, Council proposed to amend the wording to the permit condition to achieve Mr Guthrie’s recommendations on the height and extent of the buffer.

Neoen and X-Elio proposed that the purpose of the Landscape Plan be spelled out in the permit condition to clarify the purpose is to address the visual amenity of the solar project by creating an effective vegetative buffer.

X-Elio proposed a new requirement for the Landscape Plan to include a maintenance and monitoring program to ensure the health of the landscaping.

CleanGen, X-Elio and Neoen opposed a permit requirement that prescribed six rows of trees and shrubs. CleanGen submitted that the requirement should be for plantings to be of varying heights to provide screening at all levels, and that the mix of plants should be determined by the landscape designer rather than prescribed in the permit condition. Neoen proposed a requirement for the vegetation buffer to be a minimum width of seven metres, using a mixture of local trees and understorey species.

Tatura East

CleanGen submitted that *"Farming zone dwellings must expect a certain level of farming and associated farming industry activity nearby"* and that there should be no requirement to mask the sites entirely in the landscape. However, CleanGen did not object to Council's proposed permit condition requiring plantings to extend to all boundaries of the site.

CleanGen considered that the height of the panels coupled with the setbacks from the boundary and proposed plantings will not cause unreasonable visual detriment to neighbouring properties or to users of Turnbull Road. It added that it did not object to up to six rows of indigenous screening vegetation of varying heights to three metres planted adjacent to the boundary fence on the boundaries shared with 1280 Turnbull Road (within the proposed setback).

Regarding visual amenity from the public realm on Turnbull Road, CleanGen submitted:

The flat landscape, lack of pedestrian use and fleeting visual impacts for motorists mean this treatment is appropriate.

CleanGen requested a permit condition specifying a setback of not less than 25 metres from the solar arrays to the property boundary of 1280 Turnbull Road, Tatura East. It explained that this would result in a minimum setback of about 40 metres to the dwelling. It submitted that private open space for the dwelling is shielded on the western side by a building set closer to the boundary.

CleanGen said that it could agree to a 35-metre setback between the arrays and the boundary around 1280 Turnbull Road but it sought a 25-metre buffer as a permit condition. The 1280 Turnbull Road property owner submitted that he wanted CleanGen to approach him about a suitable setback and screening and that CleanGen had not attempted to contact him directly. He disagreed with the 35-metre setback and instead sought a minimum 50-metre setback.

Another Turnbull Road property owner, directly opposite the Tatura East subject land, sought a setback greater than 10 metres between the solar arrays and the subject land boundaries to address potential glare and glint and night lighting.

Several submitters on Ferguson Road, north of the subject land who sought a greater setback to address amenity issues and the PVHI effect. CleanGen submitted that the distance

between the solar arrays and the northern boundary to Fergusson Road will be 450 metres as the solar arrays will not be installed on that part of the owner's property.

Lemnos

Neoen opposed the requirement to landscape the entire boundary of the subject land. It submitted that it plans to set back its solar arrays 50 metres from the property boundary and, given the flat terrain and modest size and height of the solar panels, any attempt to further conceal the solar energy facility from adjoining properties and roads is unnecessary.

Neoen explained that vegetation screening around the entire project boundary would require over 10 kilometres of screening. It would extend along Boundary Road (an unsealed and little utilised road) and Tank Corner East Road which already has excellent screen of trees along most of the northern boundary of the Project site. It submitted that this would be a grossly disproportionate response to the perceived landscape and visual impacts of the project.

Neoen submitted that Council's proposal for the Landscape Plan to include how ground cover under the solar arrays is maintained and the management of fire risk should be deleted. It added that it does not propose to remove all vegetation beneath the arrays. It submitted that the requirements for fire management plans in a separate clause in the permit conditions removes the need for this requirement as part of the Landscape Plan.

Fencing

One submitter sought fencing to be post and rail rather than chain link fencing. Another said that there is nothing to say there won't be high barbed wire industrial style fencing around her property.

The relevant conditions in each draft planning permit require each applicant to provide detailed plan of perimeter fencing as part of the civil construction requirements. The plans must be to the satisfaction of the responsible authority.

(iii) Discussion

The Panel acknowledges the concerns of neighbouring property owners and residents about the visual impact of the proposed solar energy within the rural landscape. The Panel is persuaded by the opinions of the expert witnesses that the visual impact will be minimal given the topography and the setback requirements.

For residential properties abutting the subject land, the Panel adopts the evidence of Mr Glossop and Mr Guthrie for a landscape buffer to provide visual screening and sightlines to the solar arrays. The Panel also adopts Mr Guthrie's opinion that the permit condition should specify the height and width of the vegetation area. However, there is no justification to require vegetation screening to abutting land which is used primarily for agricultural purposes or for any non-abutting land.

The Panel agrees that the purpose of the landscape buffer should be spelled out in the permit and that the permit conditions should not prescribe details about how many rows of trees or shrubs and what type of plants should be selected. That is a matter best left to landscape designers. The permit condition requiring the Landscape Plan to be prepared to

the satisfaction of the responsible authority ensures that Council will be able to influence the choice of plants and layout in each location.

The Panel notes Mr Guthrie's opinion that the permit condition should require the vegetation screen to extend along all boundaries of the solar energy facilities. It has considered the impact that such a requirement would have on the Neoen site and the visual screening that Neoen is already planning. Given the expert evidence that the visual impacts will be minimal the Panel sees no justification for the requirement.

The Panel notes that there may be site-specific circumstances for additional screening vegetation to address some views from the public realm which can be considered by the responsible authority when approving the Landscape Plan.

The Panel believes X-Elio's proposal for the Landscape Plan to include a maintenance and monitoring program is a useful response to the concerns expressed by submitters about maintenance of the plantings and weed management. It is in addition to a clause in Council's proposed permit conditions imposing an obligation on the applicants to maintain the landscaping and replace any dead plants to the satisfaction of the responsible authority.

The Panel agrees with Neoen that the requirements for fire management plans in a separate clause in the planning permit conditions removes the need for the Landscape Plan to address how ground cover is maintained.

The Panel notes that some submitters were concerned about the visual impact of fencing but it does not see any reason for an additional planning permit condition. The Civil Construction Requirements in the permit condition will require applicants to provide details about the perimeter fencing of the land to Council. There are sufficient decision guidelines in the Planning Scheme for Council to consider the visual impact of perimeter fencing on adjoining properties and the public realm at that stage.

(iv) Conclusions

The Panel concludes:

- Landscape screening vegetation should be provided to soften views to the solar arrays and buildings, and to provide screening, from abutting residences.
- Landscape screening vegetation is not required in locations which do not interface from abutting residences.
- Screening vegetation should be at least seven metres deep and three metres tall using a mixture of trees and understorey species.
- Any site-specific circumstances for additional screening vegetation to address views from the public realm can be considered by the responsible authority when approving the Landscape Plan.
- Each applicant should have a vegetation maintenance program, which includes the replacement of any dead or diseased plants.
- The Civil Construction Requirements proposed in the draft permit conditions will enable the responsible authority to assess the visual impact of perimeter fencing on adjoining properties and the public realm.

4.9 Fire management

(i) The issue

The issue is whether fire matters can be satisfactorily managed.

(ii) Evidence and submissions

Eight submissions were concerned about fire related matters associated with the solar energy facilities at Tatura East and Lemnos. Three submissions did not provide reasons. Reasons provided in the other five submissions include:

Tatura East

- the subject land is in a designated fire zone
- the vegetation screen could pose a bushfire risk to neighbouring properties.

Lemnos

- summer bushfire risk
- there is no plan to manage grasses which can cause fire damage
- there is no plan if a fire occurs at night or during the weekend
- uncertain whether burning solar panels and batteries would release toxic smoke and harmful chemicals on neighbouring farms and human life.

Council submitted that it had referred the Tatura East, Congupna and Lemnos permit applications to the Country Fire Authority. The Country Fire Authority required the following conditions on the three permits:

Country Fire Authority Requirements

Before the development starts, plans to the satisfaction of CFA must be submitted and approved by CFA and the responsible authority. When approved, the plans will be endorsed and then form a part of the permit. The plans mentioned above must include the following:

- (a) Fire Management Plan*
- (b) Bushfire Risk Assessment, incorporating water supply requirements*
- (c) Fuel Reduction and Maintenance Plan*
- (d) Emergency Management Plan*
- (e) Any other risk management information for the site.*

The Tatura East permit included an additional requirement:

Once endorsed the plans must be implemented to the satisfaction of the responsible authority.

In his evidence statement, Mr Glossop highlighted that a renewable energy facility is not included as one of the land uses listed in Clause 13.05 of the Planning Scheme which need to be considered when assessing a permit application in a bushfire prone area.

CleanGen sought to change the condition for the Tatura East permit to revise the title to 'Fire and Emergency Management Plans', delete the bushfire risk assessment requirement

and add in Condition 1 (Amended plans required) the need for the Fire and Emergency Management Plans required by condition 12. X-Elio sought to change the condition for the Tallygaroopna and Congupna permits so that the responsible authority approve the relevant plans, having regard to the requirements of the Country Fire Authority.

At the Hearing, Mr Allen represented the Country Fire Authority. He explained that the Country Fire Authority would require grass to be maintained to less than 100 millimetres between September and April each year.

At the Hearing, Council said it sought consistent fire management conditions for all four planning permits.

(iii) Discussion

The Bushfire Management Overlay does not apply to any subject lands and a solar energy facility is not a land-use listed in Clause 13.05 for requiring a bushfire risk assessment.

The Panel notes that Council has included the Country Fire Authority's conditions on the three permits which it referred. It considers that the preparation of the three plans, a bushfire risk assessment and other risk management information will provide a well-rounded comprehensive response to fire, bushfire and emergency management matters. The Panel agrees with X-Elio's change to have the responsible authority approve the relevant plans, having regard to the requirements of the Country Fire Authority. This will provide a clear decision process while retaining the Country Fire Authority's important role in the process.

The additional requirement proposed for the Tatura East permit is inconsistent with requirements throughout all four draft permits. The Panel considers that this condition should be deleted.

(iv) Conclusion

The Panel concludes:

- Fire, bushfire and emergency management matters can be satisfactorily managed through permit conditions.
- Changes proposed by X-Elio for the Country Fire Authority's conditions will provide a clearer decision process all four planning permits.
- The additional endorsement condition for the Tatura East draft permit does not apply to the other three draft permits, is unnecessary and should be deleted.

4.10 Construction management

(i) The issue

The issue is whether the proposed Construction Management Plan can satisfactorily address issues related to traffic volume, dust, noise and safety during the construction phase.

(ii) Submissions

Regarding all proposals except for Tallygaroopna, there were submissions which objected because of traffic volume, dust, noise and safety during the construction phase.

Council submitted that a Construction Site Management Plan would need to be prepared, approved and implemented to the responsible authority's satisfaction before works commenced. This would be implemented through a suit of permit conditions on all four planning permits which would require, among other matters, showing:

- measures to retain dust, silt and debris on site, both during and after the construction phase
- where access to the site for construction vehicle traffic will occur
- the location of trenching works, boring, and pits associated with the provision of services.

(iii) Discussion and conclusion

The Panel accepts Council's submission on this matter. The Panel concludes that the proposed Construction Site Management Plan requirements in the draft planning permits (Appendices D, E, F and G) will satisfactorily address amenity related matters such as traffic volume, dust, noise and safety during the construction phase.

4.11 Maximum discharge rate

(i) The issue

Civil construction requirements are proposed for all four planning permits, including:

Before any of the development starts, detailed plans with computations to the satisfaction of the responsible authority must be submitted to and approved by the responsible authority. When approved, the plans will be endorsed and will then form part of the permit. The information submitted must show the details listed in the council's Infrastructure Design Manual (IDM) and be designed in accordance with the requirements of that manual, including:

...

d) maximum discharge rate shall not be more than 1.2 l/sec/ha

The issue is whether permit condition should specify a maximum discharge rate.

(ii) Submissions

Six objectors were concerned about potential drainage related issues. Council submitted that the specified maximum drainage rate is from its Infrastructure Design Manual. At the Hearing, Neoen and X-Elio said the specified discharge rate should be deleted because it is not clearly understood, may be higher than the actual existing discharged rate, and it may not be the correct maximum rate to apply. Neoen questioned the specified rate because it was not requested by Goulburn-Murray Water – the authority whose infrastructure will receive water draining from the subject land.

(iii) Discussion and conclusion

The Panel notes that the overarching requirement states that *"information submitted must show the details listed in the council's Infrastructure Design Manual (IDM) and be designed in accordance with the requirements of that manual."* This is sufficient for alignment with measures such as the manual's specified discharge rate. The permit condition does not need

to repeat it, especially if the ultimate rate determined through the civil construction process may achieve a better outcome. This does not diminish the final drainage response that would be approved by the responsible authority.

The Panel concludes:

- Requiring information submitted to be designed in accordance with the requirements of council's Infrastructure Design Manual sufficiently addresses the specified discharge rate.
- The specified discharge rate should not be duplicated as a permit condition.

4.12 Decommissioning

(i) Background

Condition 3 of the draft planning permits require a section 173 which must include:

- (a) *Within three months of the solar farm use ending a decommissioning and rehabilitation management plan prepared by a suitably qualified person must be submitted to the responsible authority for approval. The plan must include but is not limited to:*
- (i) *identification of structures, including but not limited to all solar panels, substation, buildings and electrical infrastructure, including underground infrastructure to be removed and how they will be removed*
 - (ii) *details of how the land will be rehabilitated back to its pre-development condition, including irrigation layout and soil profile*
- (b) *Within 12 months of the endorsement of the decommissioning and rehabilitation management plan all the decommissioning and rehabilitation must be completed to satisfaction of the responsible authority.*

Council's Part B submission included the following words at the beginning of (a):

The Owner must implement the decommissioning and rehabilitation management plan to the satisfaction of Council, at its cost.

(ii) The issue

The issues are:

- whether each solar energy facility should be decommissioned, or the subject land rehabilitated or both
- if one or both should apply, how should this requirement be expressed?

(iii) Submissions

Council submitted that the section 173 agreement is needed to ensure that the obligation to decommission the facility and rehabilitate the land rests with the property owner and is not shifted to the community.

CleanGen opposed the section 173 agreement requirements because the solar energy facility would not have an off-site impact and such an agreement is unnecessary. X-Elio considered a permit condition would be more appropriate than a section 173 agreement for requiring such changes.

X-Elio and Neoen sought to change the requirement to rehabilitate the land back to its *"predevelopment condition."* X-Elio sought to delete those words in the Congupna planning permit. Neoen proposed that it be defined as *"rehabilitated to allow it to be used for agricultural purposes (or proposed alternative use)."* X-Elio submitted that the Tallygaroopna permit should only require the identification of structures to be removed so that useful infrastructure needed for the ongoing use of the land is not removed. For the Congupna site, only above-ground structures should be required to be removed.

Neoen suggested similar changes for the Lemnos permit but did not seek to change the section 173 agreement requirements to permit conditions. Neoen requested that the requirement to remove *"all electrical infrastructure, including underground infrastructure"* be replaced a requirement to remove *"electrical infrastructure to a depth of 50mm."*

(iv) Discussion

The Panel agrees with Council that there should be a requirement to decommission each facility when no longer required.

The Panel agrees with X-Elio and Neoen that the requirement should be carefully drafted to achieve intended outcomes – remove unrequired infrastructure and buildings so that it can be used for agriculture or another appropriate use. There would be nothing to rehabilitate beyond this outcome. There is no evidence that the facilities will contaminate the land or have off-site impacts beyond what would normally be associated with surrounding activities in the Farming Zone.

To assess how this requirement should be implemented, the Panel considered the functional difference between a section 173 agreement or a planning permit condition. Section 173 of the Act enables a responsible authority to enter into a legal agreement with an owner of land, or a person in anticipation of becoming the owner of the land. The agreement can be registered on the property title to bind its requirements on future owners and occupiers of the land. A planning permit is also a legal document which applies to the land for which it has been granted and its conditions can apply to the owner or operator.

The Panel considers that a section 173 should only be applied if a planning permit condition cannot achieve a similar outcome. A permit condition which adopts the X-Elio and Neoen wording can clearly achieve Council's intended outcome without the need for an agreement. An agreement may have been needed if Council required a bond and guarantee which were tied to rehabilitation or decommissioning.

The Panel does not consider that responsibility to decommission infrastructure on private property would be shifted to the community. Council can exercise enforcement action on an operator which does not comply with a planning permit condition. Should the operator cease to exist, responsibility would default to the property owner.

(v) Conclusions

The Panel concludes:

- The solar energy facility, when no longer required, should be decommissioned so that the land can return to agriculture or another appropriate use.
- There is no need to rehabilitate beyond this outcome.
- The requirement to decommission the facility:
 - should be imposed on the permit holder rather than the property owner
 - should be a permit condition instead of a section 173 agreement.

4.13 Staged development (facility commencement)**(i) The issues**

The following condition is specified in 'Amended Plans Required' and 'Civil Construction':

Before the operation of the solar farm commences all buildings and works as shown on the endorsed plans must be constructed in accordance with the endorsed plans to the satisfaction of the responsible authority.

The issues are:

- whether the permit conditions should be drafted to enable the Tallygaroopna and Congupna facility to be constructed in stages
- if staged, what approval is appropriate for each stage.

(ii) Submissions

For the Tallygaroopna and Congupna permit applications, X-Elio explained that the final condition requiring all buildings and works to be completed before the solar energy facility can operate, does not enable staged development.

X-Elio explained that it intends to develop its facilities in stages. This is not possible because Condition 1 and the last paragraph of Condition 4 require all buildings and works to be constructed to the satisfaction of the responsible authority before use or operation commences. X-Elio requested that these clauses be deleted to enable staged development on both of its sites.

(iii) Discussion

The Panel agrees with X-Elio that it would be more logical and practical to provide the opportunity to construct solar energy facilities of those scales in stages. The responsible authority may wish to consider providing the same opportunity for all permits.

The Panel agrees that staged development should be enabled, however, it does not agree that this should be achieved by not requiring buildings and works to comply with the approved plans. The permit condition can be amended to enable compliance at each stage.

It is noted that model permit conditions in *Policy and planning guidelines: Development of wind energy facilities in Victoria*, DELWP 2017, enable staged development for a wind energy facility.

(iv) Conclusion

The Panel concludes:

- The permit conditions should be drafted to:
 - enable the Tallygaroopna and Congupna facilities to be constructed in stages
 - require buildings and works for each stage to be constructed to the satisfaction of the responsible authority.
- While the Panel has not recommended changes to the Tatura East and Lemnos planning permits, the same conditions should be considered for these two permits.

4.14 Permit expiry**(i) The issue**

The permit expiry conditions in the draft permits specify that the permit expires if:

- *the development and use has not started within two (2) years of the date of the permit, or*
- *the development is not completed within four (4) years of the date of the permit.*

The issue is whether the permit expiry dates should be extended to enable the solar energy facilities to be completed.

(ii) Submissions

X-Elio sought to extend the permit expiry dates for the Tallygaroopna and Congupna permits so that development, but not use, is commenced in three years and completed in six years. It explained that the draft permit expiry dates do not enable X-Elio to stage its solar energy facility over an extended timeframe.

Similarly, CleanGen requested to extend the permit expiry dates for the Tatura East permit so that development and use is commenced in three years and completed in five years.

(iii) Discussion and conclusion

The permit expiry dates on the draft planning permits are default standard timeframes which are generally suitable for most developments. However, the scale of each proposed solar energy facility and the many consents that need to be achieved before development commences will require more time. They certainly do not enable sufficient time to construct a facility in stages.

The Panel concludes that extending the permit expiry date provides more practical timeframes to achieve necessary consents before works can commence and to complete the solar energy facility in stages, if required.

4.15 Farming Zone

(i) The issue

The issue is whether a solar energy facility should be in the Farming Zone. This differs to whether the facility should be in the Goulburn-Murray Irrigation District.

(ii) Evidence and submissions

Council submitted that each of the solar energy facilities are proposed on land in the Farming Zone. It explained that using and developing land for a renewable energy facility is permitted through Section 2 (Permit required) of that zone. Council referred to its economic development local planning policy (Clause 21.06 of the Planning Scheme) which provides the following policy guidelines for assessing a permit application for a non-agricultural use in the Farming Zone:

Discourage industrial use and development (other than rural industry) in rural areas, except where:

- a) It is unable to be accommodated in existing industrial zoned areas*
- b) It does not compromise the surrounding existing and future agricultural practices*
- c) It adds value to the agricultural base of the municipality*
- d) It is a rural-based enterprise*
- e) It provides for the reuse of existing large scale packing sheds and cool stores.*

Council submitted that:

The sheer scale of the proposed solar farms means that insufficient land is available in zones other than the FZ.

Mr Glossop stated that a solar energy facility is an appropriate use in the Farming Zone. He explained that it is a low impact use that will lead to employment and new infrastructure. Regarding the appropriateness of solar energy facilities as a land-use in the Farming Zone, Mr O'Farrell referred to *Perry v Hepburn* [2007] VCAT 1309. This decision found that a wind energy facility is not an industrial use and is appropriate in the Farming Zone. He referred to the Farming Zone purpose and listed the many activities permitted in that zone.

There were objectors who considered a solar energy facility to be inconsistent with the Farming Zone. A considerable proportion of them objected because the Farming Zone is for agricultural land uses; not an electricity generating plant. NMB & J Barolli submitted:

The proposal does not meet or adequately respond to the purpose or decision guidelines of the Farming Zone, which is the zone selected to protect and enhance the agricultural use and potential of this land and other similarly zoned areas within the Municipality.

(iii) Discussion

The Farming Zone has purposes focussed around agricultural land. A solar energy facility is a non-agricultural land-use which the Panel considers, based on findings in Chapter 4, will not adversely affect the use of surrounding land for agriculture. Unlike non-farming residents or tourists in the Farming Zone, a solar energy facility will not complain about early morning farming machinery noise or other emissions. The two land uses can co-locate harmoniously. The proposals will retain employment; however, they will not encourage a considerable proportion of the subject lands to be retained for agriculture. The permit applications do not have to meet all the Farming Zone purposes, and in these circumstances, a professional judgement is required. The Panel considers that the Farming Zone is appropriate for the solar energy facilities subject to conditions to address and manage the identified potential on-site and off-site impacts.

(iv) Conclusion

The Panel concludes that the Farming Zone is appropriate for the four solar energy facilities because:

- the proposed facilities are of a scale which cannot be accommodated in existing industrial zoned areas
- they will not adversely impact surrounding farm operations or the broader Goulburn-Murray Irrigation District
- the soil types for each subject site are lower quality compared than other parts of the Irrigation District.

4.16 Other issues**(i) Expand to neighbouring land**

There were several objectors who sought to retain the subject land as agricultural land to enable them to expand their operations in the future. In response to a question of clarification from the Panel, one farm operator submitted that future farm expansion did not have to be contiguous with existing farm operations but ideally it should be nearby.

The Panel considers that the four solar energy facilities, proposed in different parts of the broader District, are not of the scale to restrict future farming expansion in the future. It agrees to the extent that, if left unmanaged and without further strategic guidance, the cumulative impact of additional facilities in the District, depending on their scale and location, may affect future farming expansion. This matter is outside the scope of the four permit assessments and is better addressed through strategic guidelines.

(ii) Property value

For all proposals except for Tallygaroopna, there were 21 objectors who considered that a solar energy facility would devalue their property. There was insufficient explanation or evidence to support these submissions. One property owner considered that it would be difficult for him to find someone to purchase his property.

The Panel considers that property devaluation is not a planning consideration for refusing a solar energy facility in a Farming Zone. It notes that concern about property value and resale may have been based on potential adverse impacts on neighbouring land which the Panel has concluded will not eventuate.

(iii) Native vegetation controls

Council proposed a permit conditions requiring native vegetation offsets to be approved as part of the permit for three of the permits as follows:

- 2017/301 required to offset the removal of 22 native scattered trees
- 2017/344 required to offset the removal of six native scattered trees
- 2017/274 required to offset the removal of three native scattered trees.

The proposed conditions in the draft permits state that a native vegetation offset must be provided in accordance with the *Permitted clearing of native vegetation – Biodiversity assessment guidelines and the Native vegetation gain scoring manual 2017 (Department of Environment and Primary Industries)*.

Neoen sought clarification about which version if the guidelines are relevant.

During the Hearing, Council and DELWP confirmed that the relevant guidelines applicable at the time of the assessment are the *Permitted clearing of native vegetation – Biodiversity assessment guidelines and the Native vegetation gain scoring manual 2013 (Department of Environment and Primary Industries)*.

The Panel accepts the submissions of Council and DELWP and notes that the newer version is yet to be introduced into the Victoria Planning Provisions. The Panel agrees that the four planning permits should refer to the 2013 version of the guidelines.

5 Specific permit matters

5.1 2017-162 (Tatura East)

(i) Traffic and dust during construction

The issue

The issue is whether traffic and dust can be satisfactorily managed around the Tatura East subject land during the construction phase. The Panel has found that proposed permit condition for a Construction Management Plan and Civil Construction Requirements can satisfactorily address construction management matters. This chapter considers traffic and dust matters specific to Tatura East.

Submissions

Many submitters raised concerns about the impact on them of dust and noise particularly during the construction phase.

Council proposed a permit condition in the Civil Construction Requirements in clause 4 (e) requiring the applicant to seal the section of Turnbull Road along the site's frontage to avoid dust from anticipated vehicle movements during the construction phase (Part B submission).

CleanGen sought to change the proposed requirement to seal Turnbull Road as part of the civil construction requirements to the requirements in the Construction Management Plan. Those requirements include providing details of any treatment required for the portion of Turnbull Road adjacent to the subject site to minimise dust during construction, heavy vehicle movements, construction times and site management (document 44).

CleanGen submitted that the traffic impacts of the proposal are limited to the construction phase. It added that once operational, the solar energy facility will have negligible traffic, with an estimated four standard sized vehicle movements per day, which does not require any mitigation measures.

CleanGen explained that it had discussed with Council the option of installing a sacrificial seal to Turnbull Road to minimise dust during the construction phase.

CleanGen submitted that the permit condition requiring the road to be sealed is far too broad. It added that the issue is more appropriately dealt with by the Construction Management Plan, and if a condition requiring treatment to Turnbull Road is necessary, it should not specify the exact treatment. CleanGen said that it is willing to provide a solution, but sought flexibility in finding the best approach.

CleanGen sought a new permit condition requiring a Traffic Management Plan which must show:

Measures to be taken to manage traffic impacts associated with the construction and operation of the facility; and

A program to inspect, maintain and (where required) repair the parts of Turnbull Road used by construction traffic during the period of construction of the development.

During the without prejudice discussions about the permit conditions at the Hearing, Council said that it did not take issue with CleanGen's proposed condition requiring a Traffic Management Plan.

Mr and Ms Slorach did not support the changes proposed by CleanGen and preferred the requirement for the road to be sealed.

Discussion

The Panel agrees with CleanGen that it is better to have the decision about the appropriate road treatment to reduce dust as part of the Construction Management Plan rather than specifying that the road be sealed as a permit condition.

Conclusions

The Panel concludes that Planning Permit 162/2017 should:

- not require the section of Turnbull Road adjacent to the site to be sealed, and instead should require the Construction Management Plan to address appropriate road treatment for the portion of Turnbull road adjacent to the subject site to minimise dust during the construction phase; and heavy vehicle movements
- require a Transport Management Plan which shows measures to manage traffic impacts associated with the construction and operation of the facility and measures to maintain and where required repair the parts of Turnbull Road during construction of the development.

(ii) Recommendation

Having considered all issues relevant to Planning Permit Application 2017-162, the Panel recommends:

- 1. The Minister for Planning issue Planning Permit 2017-162 with the conditions shown in Appendix D1 to this report.**

5.2 2017-274 (Tallygaroopna)

Having considered all issues relevant to Planning Permit Application 2017-274, the Panel recommends:

- 2. The Minister for Planning issue Planning Permit 2017-274 with the conditions shown in Appendix D2 to this report.**

5.3 2017-301 (Lemnos)

(i) Setbacks and vegetated screening

The issue

The Panel has found that any visual impact can be addressed through:

- a minimum setback of a 30-metre setback from a solar array to any neighbouring property boundary
- a landscape vegetated screening of 7 metres deep and 3 metres tall.

Neoen proposes to set back the solar arrays 50 metres from its property boundary. The issue is whether a setback greater than what is required to address visual impact should be specified in the permit.

Evidence and submissions

Neoen submitted that its subject land comprises nine parcels in five landholdings and approximately 482 hectares. The site is surrounded by agricultural properties of various sizes and dimensions, and the Valley Star Freedom vegetable processing and packing farm is located to its immediate south, at 1337 Cosgrove-Lemnos Road. There are several smaller farms on the northern and southern sides of the road, including three dwellings that face towards the project site. Horticulture is concentrated south of the Cosgrove-Lemnos Road, and some land under horticulture west of the subject land, under and adjacent to the 220kV transmission line. On the southern side of this road, for most of the project site's length, is Drain 8/4.

Neoen explained that southeast of the subject land is a holiday accommodation business at 1355 Cosgrove-Lemnos Road called 'The Mansion', and at the northwest of the project site is a small lot containing a dwelling and outbuilding.

Neoen submitted that it plans to set back the solar arrays 50 metres from the property boundary on all sides in response to its understanding of community sentiment and because it can comfortably achieve this setback without compromising energy output.

Neoen proposes to landscape along most of its southern boundary and along sections of the northern boundary to obscure views of the solar energy facility from dwellings. Mr Power submitted that Neoen proposes landscaping only for targeted residents on Cosgrove-Lemnos Road. It has been speaking with those residents about screening from the site and may provide them with funding to plant some screening on their land, if requested. Neoen proposes to landscape some of the northern boundary.

Mr Power highlighted that, while the early designs involved clearing 22 native trees on the subject land, the development has been redesigned to minimise tree removal.

Ms Ritter, the owner of an abutting property, sought to require vegetated screening plants of at least 1.5 metres tall at the time of planting because she was concerned that it would take a long time for plants to grow and provide a screen. She preferred a non-reflective fence to provide a screen until the vegetation grows. She submitted that all the existing trees on the property boundary should be retained, including the row of pine trees on the northern boundary.

Mr MacGill submitted that his property shares the longest boundary with the Lemnos subject land and requested a landscape buffer around his property, which he said Neoen had not yet agreed to.

Another resident sought perimeter fencing to be replaced by vegetation, especially on the northern boundary where no vegetated buffer is planned, because there is no direct neighbour there.

Discussion

The Panel has considered the submissions seeking to require Neoen to provide a visual screen of a greater extent than the Panel recommends in Chapter 4.

The Panel commends Neoen for proposing a 50-metre setback from the solar arrays and to provide vegetation screening in response to its neighbours. This would result in a 70-metre setback for properties on the opposite side of a 20-metre road reservation. The visual impact of solar arrays, infrastructure and buildings would be considerably diminished when viewed at this distance.

The Panel is unable to specify a minimum setback of greater than 30 metres between a solar array and any neighbouring property boundary because it is not required to address any potential visual impact. However, this does not preclude the Lemnos solar energy facility for applying a 50-metre setback in its final plans.

Conclusions

The Panel concludes:

- A minimum 30-metre setback from a solar array to any neighbouring property boundary should apply to the Lemnos solar energy facility.
- The Lemnos solar energy facility can continue to apply a 50-metre setback in its final plans.
- Any site-specific circumstances for additional screening vegetation to address views from the public realm can be considered by the responsible authority when approving the Landscape Plan.

(ii) Goulburn-Murray Water requirements

The issue is whether Goulburn-Murray Water's permit condition prohibiting 'buildings' within 30 metres of creeks, open channels and drains should exclude solar panels.

Neoen sought to clarify that 'buildings' does not include solar panels by adding those words to the permit condition. At the Hearing, Goulburn-Murray Water explained that it did not intend to exclude solar panels from being constructed within 30 metres of a creek or open channel or drain.

Neoen requested the following change to the Goulburn-Murray Valley permit condition:

- (a) No buildings other than the solar panels are to be constructed within 30 metres of OKeefe Creek, or and Goulburn-Murray Water's open channels (no. 14A, 7/14A, 15) and drains (no. 6/11, 8/4), or within the Floodway Overlay (FO).*

The Panel notes Goulburn-Murray Water's clarification and agrees that the relevant permit condition should be revised to clarify that solar panels can be constructed within 30 metres of a creek or open channel or drain.

(iii) Goulburn Broken Catchment Management requirements**The issue**

The issue is whether the Goulburn Broken Catchment Management Authority permit conditions to meet flood protection requirements should require fencing or specify fencing type, if fencing is proposed.

Submissions

The draft Lemnos planning permit includes the following building and fencing conditions required by the Goulburn Broken Catchment Management Authority:

- *The finished floor levels of the proposed substation, control room and O and M building must be constructed at least 300 millimetres above the applicable 100-year ARI flood level of 115.2 metres AHD, i.e. 115.5 metres AHD, or higher level deemed necessary by the responsible authority.*
- *A 200 metres length of fencing along the Cosgrove-Lemnos Road and within the Rural Floodway Overlay, it must be constructed as post and wire or post and rail farm type fencing. Alternatively pool type fencing with vertical bars spaced at least 150 millimetres apart.*
- *A 200 metres length of fencing along the western boundary of the property, and immediately north of the Goulburn Murray Channel 7A/14, within the Rural Floodway Overlay, it must be constructed as post and wire or post and rail farm type fencing. Alternatively pool type fencing with vertical bars spaced at least 150 millimetres apart.*

Five submitters were concerned about potential flooding and drainage associated with the Lemnos subject land.

Mr MacGill, Ms Cobbledick and Ms Evans considered that the proposed 'vertical fencing' may flood their adjoining properties. They said that they had been told that the Goulburn Broken Catchment Management Authority and Goulburn-Murray Water would look at it but they felt that nothing had been resolved. In response to a question from the Panel, Ms Ritter said that she was not aware of the proposed drainage-related permit conditions.

Mr Anthony O'Callaghan submitted that the fence around the Lemnos site will build up and act as a levy bank and cause flooding.

Neoen sought to vary the permit condition wording to specify that post-and-wire fencing conditions should only apply if fencing was proposed instead of requiring fencing of at least 200 metres. It also sought to delete the alternative requirement for pool fencing in the last sentence of condition (b) and (c). Goulburn Broken Catchment Management Authority submitted that this change was appropriate.

Mr Davis and Ms Evans submitted that the local area had a history of flooding and was concerned that the proposed internal roads would exacerbate this problem. Ms Evans considered that reference to the 100-year Average Recurrence Interval (ARI) flood level is misleading and inconclusive because there have been two larger flood events.

He considered that the Goulburn Broken Catchment Management Authority has not shown the appropriate level of concern for such an impact. Mr Davis opposed the Authority's fencing requirement from a visual impact perspective.

Discussion

As discussed in Chapter 4, Council's permit conditions require Civil Construction Plans to be submitted to the satisfaction of the responsible authority. Those plans will need to demonstrate compliance with the Catchment Management Authority's conditions and to detail how the works on the land are to be drained, how drainage design allows for continuation of existing overland flow paths across the land and documentation demonstrating approval from the relevant authority for the legal point of discharge.

The proposed changes to the Goulburn Broken Catchment Management Authority's permit condition on fencing requirements are practical and meet the requirements of the relevant authority.

Conclusions

The Panel concludes:

- Relevant drainage-related permit conditions can satisfactorily address matters raised in submissions.
- As agreed to by the Goulburn Broken Catchment Management Authority:
 - fencing should not be required
 - fencing design requirements should be specified for circumstances where fencing is proposed.

(iv) Recommendation

Having considered all issues relevant to Planning Permit Application 2017-301, the Panel recommends:

- 3. The Minister for Planning issue Planning Permit 2017-301 with the conditions shown in Appendix D3 to this report.**

5.4 2017-344 (Congupna)

Having considered all issues relevant to Planning Permit Application 2017-344, the Panel recommends:

- 4. The Minister for Planning issue Planning Permit 2017-344 with the conditions shown in Appendix D4 to this report.**

Appendix A Submitters to the Permits

Permit application 2017-162 (Tatura East)			
No	Submitter	No	Submitter
1	Steven Perkins	21	Jonny McNeill
2	James Perkins	22	Gail & Darryl Bailey
3	Amanda Perkins	23	Kristian McNeill
4	Tracy & Sam Catalona	24	Sharon McCarthy
5	Roger & Cindy Coverdale	25	Tony McCarthy
6	Daniel Wright	26	Amendra Singh
7	Shane Hall	27	Dana Lynch
8	Peter Hall	28	Geoff Lynch
9	Todd Hall	29	Sue Lynch
10	Geoff & Rachael Slorach	30	LA Bulk Transport Pty Ltd
11	Marjory Wheller	31	Sandra Kington
12	J & E Pena	32	Bruce Gall
13	Michael Sleeth	33	Eileen Frankland
14	Trevor Bailey	34	Garry Attwood
15	Adam Dorsett	35	Maria Nugen
16	Joanne Crow	36	Steve Kington
17	Vicki Emanuelli	37	Andrew Fox
18	Ryan Schlabach	38	Sunny Side Farming Ardmona
19	Jack Liversidge	39	Petra Aitken
20	Stacey Bailey		

Permit application 2017-274 (Tallygaroopna)			
No	Submitter	No	Submitter
1	Tony Farrell	4	G & N Akers
2	Chris Calder	5	Murray Akers
3	Clement Stone Town Planners		

Permit application 2017-301 (Lemnos)			
No	Submitter	No	Submitter
1	Bernard Jones	11	Damien Blackledge
2	Ken & Coral Downing	12	Jesse Blackledge
3	Dallas & Krista Terlich	13	Bailey Blackledge
4	Jim & Lynne Evans	14	Tony O'Callaghan
5	Kate Greenall	15	J Collins
6	Neil & Lois Congram	16	L & R Cobbledick
7	Brett Davis	17	PJ & E MacGill
8	Anne & Michael Ritter	18	Tony Farrell
9	E Kiriacos	19	Clement Stone Town Planners
10	Caroline Poole	20	Ken Martin*

Permit application 2017-344 (Congupna)			
No	Submitter	No	Submitter
1	Marg Thorn	4	Chris Calder
2	Ken Martin	5	NMB & J Barolli
3	Tony Farrell	6	Country Fire Authority

All permits			
No	Submitter	No	Submitter
L1	Victorian Farmers Federation*	L3	Phillip Hone*
L2	Committee for Greater Shepparton*		

* Late submission referred to the Panel from the Minister for Planning

Appendix B Parties to the Panel Hearing

Submitter	Represented by
Minister for Planning	Tim Doolan
Greater Shepparton City Council	Dr Joseph Monaghan of Holding Redlich and calling the following expert evidence: <ul style="list-style-type: none"> - Solar energy from Ken Guthrie of Sustainable Energy Transformation Pty Ltd - Agriculture and economics from Rob Rendell of RMCG - Horticulture and Livestock from Dr Doris Blaesing of RMCG
Neoen Australia Pty Ltd	Tim Power and Michelle Keen of White & Case and calling the following expert evidence: <ul style="list-style-type: none"> - Planning from Andrew Clarke of Matrix Planning - Agriculture from Ray Phillips of Phillips Agribusiness - Heat island effect from Dr Greg Barron-Gafford of the University of Arizona
X-Elio Australia Pty Ltd	Peter O'Farrell of Counsel and Serena Armstrong of Counsel, instructed by Isabella Kelly of Allens and calling the following expert evidence: <ul style="list-style-type: none"> - Planning from John Glossop of Glossop Town Planning - Economics from Dave Appels of Frontier Economics
CleanGen	Tiphonie Acreman of Counsel, instructed by Jacqueline Plant of Norton Rose Fulbright and calling the following expert evidence: <ul style="list-style-type: none"> - Economics from John Noronha of Essential Economics
Country Fire Authority	Matt Allen
Goulburn-Murray Rural Water Corporation	Graeme Hannan
Committee for Greater Shepparton	Sam Birrell
Victorian Farmers Federation	Lisa Gervasoni
Natalie Akers	
Clement Stone Town Planners	Kyle O'Brien
Anne and Michael Ritter	Anne Ritter
Patrick and Elizabeth MacGill	Patrick MacGill
LR and RJ Cobbledick	Lynette Cobbledick
James and Lynette Evans	Lynette Evans
Anthony O'Callaghan	
NMB & J Barolli Pty Ltd	Nathan Barolli
Peter Hall	
Richard Anderson	
Geoff and Rachael Slorach	Geoff Slorach

Appendix C Document list

No.	Description	Presented by
7 May 2018		
1	Part A submission	Council
2	Expert witness statement – Ken Guthrie	Council
3	Expert witness statement – Rob Rendell	Council
4	Expert witness statement – Doris Blaesing	Council
5	Expert witness statement – Andrew Clarke	Ms Keen
6	Expert witness statement – Ray Phillips	Ms Keen
7	Expert witness statement – Greg Barron-Gafford	Ms Keen
8	Expert witness statement – John Noronha	Elisa de Wit, Norton Rose Fulbright
9	Expert witness statement – John Glossop	Jillian Button, Allens
10	Expert witness statement – Dave Appels	Ms Button
11 May 2018		
11a	Expert witness conference statement – Agriculture and economics	Council
11b	Expert witness conference statement – Solar	Council
14 May 2018		
12	Submission – Minister for Planning	Mr Doolan
13	Part B Submission including attachments: <ul style="list-style-type: none"> - <i>Rosen & Anor v Macedon Ranges Shire Council & Anor</i> 181 LGERA 370 - <i>University of Melbourne v Minister for Planning (Red Dot)</i> 40 VPR 315 - Moorabool Planning Scheme Amendment C62, July 2014 - <i>Telstra Corporation Limited v Hornsby Shire Council (2006)</i> 146 LGERA 10 - <i>Western Water v Rozen & Anor</i> (2008) 24 VR 133 - Wangaratta Solar Farm Advisory Committee (ACI) [2017] PPV 126 - Wangaratta Solar Farm Advisory Committee (ACI) [2017] PPV 120 - Studies relied upon by Mr Ken Guthrie - Studies relied upon by Dr Doris Blaesing - Large-Scale Solar Power Plant Investor Prospectus - Letter of Ken Guthrie, Sustainable Energy Transformation, to Horticulture Expert Witness, 22 April 2018 - Traffic plans / Vehicle Access Plans 	Council
14	Draft Permit conditions	Council
15	PowerPoint presentation	Council

No.	Description	Presented by
16	Map – Tatura and surrounds soil types, 7 March 2000	Ms Acreman
17	PowerPoint slides – Rob Rendell	Council
15 May 2018		
18a	Map – Lemnos site	Mr Power
18b	Plan – Lemnos site waterways and water supply channel sand drains	Mr Power
19a	Plan – Lemnos site landscaping	Mr Power
19b	Proposed landscaping on Lemnos site	Mr Power
20	Submission – Neoen Australia Pty Ltd	Mr Power
21	Photos – Sheep at solar energy facility in Parkes, New South Wales	Mr Power
22	Information sheet – Sheep trial at Parkes solar energy facility	Mr Power
16 May 2018		
23	Draft Large Scale Solar Guideline, for State Significant Development, New South Wales Government, November 2017	Council
24	Planning guidance for the development of large-scale ground-mounted solar PV systems, BRE National Solar Centre, United Kingdom, October 2013	Council
25	Email – Goulburn-Murray Water on Congupna solar energy facility	Mr O'Farrell
26a	Impact of 50 metre setback	Mr O'Farrell
26b	Plan – Congupna on impact of 50 metre setback	Mr O'Farrell
26c	Plan – Tallygaroopna on impact of 50 metre setback	Mr O'Farrell
27	Submission – Victorian Farmers Federation	Ms Gervasoni
28	Submission – CleanGen	Ms Acreman
29	Email – Civil Aviation Safety Authority	Ms Acreman
30	Letter – from Sterling Wilson on traffic movement	Ms Acreman
17 May 2018		
31	Submission – Goulburn-Murray Rural Water Corporation	Mr Hannan
32	Landscape Plan Guideline for developments in Campaspe Shire Council, City of Greater Shepparton and Moira Council	Council
33	Submission – Clement Stone Town Planners	Mr O'Brien
34	Submission – Anne and Michael Ritter	Ms Ritter
35	Submission – X-Elio Australia Pty Ltd	Mr O'Farrell
36	Photos – Kerang solar energy facility	Mr Glossop
37	Submission – James and Lynette Evans	Ms Evans

No.	Description	Presented by
28 May 2018		
38	Submission – Additional information from the Chief Executive Officer	Council
39	Submission – NMB&J Barolli Pty Ltd	Mr Barolli
40	Article –Country News ‘Solar Surge’	Mr Barolli
41	Submission – Peter Hall	Mr Hall
42	Email – from Ms Evans to the Panel	Panel chair
43	Submission – Geoff Slorach	Mr Slorach
44	Without prejudice draft permit conditions – CleanGen (emailed 24 May)	Ms Plant
45	Without prejudice draft permit conditions – X-Elio	Zainab Mahmood, Allens
46	Without prejudice draft permit conditions – Neoen (emailed 24 May)	Ms Keen
47	Without prejudice draft permit conditions – Council (emailed 22 May)	Council
48	Planting palette prepared by Urbis for Lightsource	Ms Acreman
49	Corrected maps showing access ways	Council
50	Submission – Council reply	Council
Other documents		
51	50-metre setback maps and measurements (emailed 23 May)	Council
52	Links to reports on water use trends in the Goulburn Valley Irrigation District (email 14 May 2018)	Council
53	Response to Panel questions regarding the DELWP submission (email 18 May 2018)	Mr Doolan

Appendix D Panel recommended Permit 2017-162

2017-162 - 610 Ferguson Road, Tatura East - CleanGen

1. Amended Plans Required

Before the development starts, amended plans to the satisfaction of the responsible authority must be submitted to and approved by the responsible authority. When approved, the plans will be endorsed and will then form part of the permit. The plans must be drawn to scale with dimensions ~~be~~ provided. Such plans must be generally in accordance with the plans submitted with the application but modified to show:

- a) Setbacks as required by Goulburn-Murray Water; ~~and~~
- b) ~~A setback of the solar farm arrays of not less than 50 metres to property boundaries;~~ A setback of not less than 30 metres from the edge of the solar arrays to any adjoining property boundary
- c) Detailed planning drawings of the development including floor and elevation plans of all proposed buildings.

Before the use of the solar farm-energy facility commences, all buildings and works as shown on the endorsed plans must be completed to the satisfaction of the responsible authority.

2. Layout Not Altered

The use and development of the land for a solar farm-energy facility as shown on the endorsed plans must not be altered without the written consent of the responsible authority.

3. Section 173 Agreement Decommissioning plan

- ~~4. Prior to the use commencing, the owner must enter into an agreement with the Responsible Authority, pursuant to Section 173 of the Planning and Environment Act 1987 (the Act). This agreement must be registered on the title to the land pursuant to Section 181 of the Planning and Environment Act 1987. The owner must pay the reasonable costs of the preparation, execution and registration of the section 173 agreement.~~

~~The agreement must provide for:~~

~~The following requirements must be met when the solar energy facility permanently ceases operation:~~

- a) Within three months of the solar farm-energy facility use ending, a decommissioning ~~and rehabilitation~~ management plan prepared by a suitably qualified person to the satisfaction of the responsible authority must be submitted to ~~and approved by~~ the responsible authority ~~for approval~~. When approved, the plan will be endorsed and will form part of the permit. The plan must include but is not limited to:
 - (i) identification of structures to be removed, including but not limited to all solar panels, substation, buildings (if they are not useful for ongoing use) and electrical infrastructure, ~~including underground infrastructure to be removed and how they will be removed;~~
 - (ii) details of how the land will be rehabilitated to allow it to be used for agricultural purposes (or proposed alternative use). ~~back to its pre-~~

~~development condition, including irrigation layout and soil profile~~

Within 12 months of the endorsement of the decommissioning ~~and rehabilitation~~ management plan, ~~all the decommissioning and rehabilitation~~ must be completed to satisfaction of the responsible authority.

- ~~b) The photovoltaic arrays must be orientated so that the panels are perpendicular to the ground within 30 minutes of sunset until within 30 minutes of sunrise to facilitate night radiant cooling.~~
- ~~c) The operator of the solar farm accepts and acknowledges that the use and development may be subject to disturbance from agricultural activities including but not limited to spray drift, dust emissions and heavy machinery use.~~

~~The said agreement is to be prepared by Council. Council will undertake to have the agreement prepared upon written notification from the applicant. All costs associated with the preparation and registration of the agreement shall be borne by the applicant including Council's administration fee. All fees associated with the documentation must be fully paid prior to execution and registration of the document by Council.~~

4 Civil Construction Requirements

Before ~~any of~~ the development starts, detailed plans ~~with computations~~ to the satisfaction of the responsible authority must be submitted to and approved by the responsible authority. When approved, the plans will be endorsed and will then form part of the permit. The information submitted must show ~~the any relevant~~ details listed in the council's Infrastructure Design Manual (IDM) and be designed in accordance with the requirements of that manual, including~~;~~:

- a) details (and computations) of how the works on the land are to be drained including drains conveying stormwater to the legal point of discharge;
- b) details of how the drainage design allows for the continuation of existing overland flow paths across the land;
- c) documentation demonstrating approval from the relevant authority for the legal point of discharge;
- d) ~~maximum discharge rate shall not be more than 1.2 l/sec/ha;~~
- ~~e) details of the sealing of Turnbull Road frontage of the site to prevent dust generation during the construction phase;~~
- f) carparking areas, circulation lanes and access shall be designed and constructed in accordance with AustRoads Publication 'Guide to Traffic Engineering Practice: Part 11 Parking,' 'Australian Standard AS2890.1-2004 (Off Street Parking)' & 'AS2890.6 (Off Street Parking for People with Disabilities);'
- ~~g) details of lighting to be constructed on the land the site shall be properly illuminated with lighting designed, baffled and located to the satisfaction of the responsible authority to prevent any adverse effect on adjoining land;~~
- h) details of how any lighting within the site is designed, baffled and located to effectively illuminate all pertinent public areas, without spilling onto the road reserve or adjoining land, and must be connected to a time clock switch or other approved system to the satisfaction of the responsible authority
- i) details on how noise emitted from the land during the operation of the facility will not exceed the recommended levels set out in EPA Publication 1411 Noise from Industry in Regional Victoria, 2011 as amended and replaced;
- j) details of the boundary fencing of the land.

to the satisfaction of the responsible authority.

All parking spaces must be designed to allow all vehicles to drive forwards both when entering and leaving the property.

The access and parking areas must be constructed and drained to prevent diversion of flood or drainage waters, and well maintained in a continuously useable condition to the satisfaction of the responsible authority.

Parking spaces, access lanes and driveways must be kept available for these purposes at all times.

Before the operation of the solar farm-energy facility commences all buildings and works as shown on the endorsed plans must be constructed in accordance with the endorsed plans to the satisfaction of the responsible authority.

5. Landscape Plan

Before the development starts, three copies of a landscape plan must be submitted to and approved by the responsible authority. When approved, the plan will be endorsed and will then form part of the permit. The plan must be drawn to scale with dimensions and must include: three copies must be provided;

- a) a survey of all existing vegetation and natural features showing plants (greater than 1200mm diameter) to be removed;
- b) a schedule of all proposed trees, shrubs and ground cover, including the location, number and size at maturity of all plants, the botanical names and the location of areas to be covered by grass, lawn or other surface materials as specified;
- c) ~~how the land under the solar arrays maintains ground cover at a reasonable level and the management of the ground cover in the fire season;~~
- d) details of permanent vegetation buffers with a minimum depth of seven metres and height of three metres at full maturity along any abutting residential property boundary to provide visual screening; ~~details of permanent screening trees and shrubs with a minimum of six rows using a mixture of local trees and understorey species~~
- e) a maintenance and monitoring program to ensure the ongoing health of the landscaping, including weed management and the replacement of dead or diseased plants.

All species selected must be to the satisfaction of the responsible authority.

Before the commencement of the use or by such a later date as is approved by the responsible authority in writing, landscaping works shown on the endorsed plan must be carried out and completed to the satisfaction of the responsible authority.

Once the landscaping planting is carried out the landscaping must be maintained including the replacement of any dead or diseased plants to the satisfaction of the responsible authority.

6. Construction Management Plan

Prior to commencement of works, a Construction Site Management Plan in accordance with Council's Infrastructure Design Manual must be prepared, approved and implemented to the satisfaction of the responsible authority. The plan must show:

- a) measures to control erosion and sediment and sediment laden water runoff, including the design details of structures;
- b) measures to retain dust, silt and debris on site, both during and after the construction phase;
- c) locations of any construction wastes and the method of disposal, equipment, machinery and/or earth storage/stockpiling during construction;
- d) where access to the site for construction vehicle traffic will occur;
- e) tree protection zones;
- f) the location of trenching works, boring, and pits associated with the provision of services; ~~and~~
- g) the location of any temporary buildings or yards;
- h) details of any treatment required for the portion of Turnbull Road adjacent to the subject site to minimise dust during the construction phase
- i) heavy vehicle movements
- j) construction times
- k) details of a site contact/site manager
- l) details of how the construction phase will comply with EPA Publication 1254, Noise Control Guidelines, 2011 as amended and replaced.

During the construction phase all measures identified in the endorsed construction management plan must be implemented to the satisfaction of the responsible authority.

7. **General Amenity**

Before the use commences, an Environmental Management Plan must be prepared, approved and implemented to the satisfaction of the responsible authority. The Environmental Management Plan must include:

- a) overall environmental objectives for the operation of the solar energy and techniques for their achievement;
- b) day-to-day management requirements for the use;
- c) procedures to ensure that no significant adverse environmental impacts occur as a result of the use;
- d) identification of possible risks of operational failure and response measures to be implemented; ~~and~~
- e) a program for recording and reporting environmental incidents or non-compliances with this permit and for responding to complaints during operation of the solar energy.

~~The use and development permitted by this permit must not, in the opinion of the responsible authority, adversely affect the amenity of the locality by reason of the processes carried on; the transportation of materials, goods or commodities to or from the subject land; the appearance of any buildings, works or materials; the emission of noise, artificial light, vibration, smell, fumes, smoke, vapour, steam, soot, ash, dust, waste water, waste products, grit, or oil; the presence of vermin, or otherwise.~~

~~Prior to the use commencing any security alarm installed on the premises must be 'silently wired' to a security firm or the Victoria Police.~~

~~Prior to the use commencing any lighting within the site must be designed, baffled and located in such positions so as to effectively illuminate all pertinent public areas, without spilling onto the road reserve or adjoining land, and must be connected to a time clock switch or other approved system to the satisfaction of the responsible authority.~~

8. Fire and Emergency Management Plans

Before the development starts, plans must be prepared to the satisfaction of the responsible authority having regard to the requirements of and CFA the Country Fire Authority must be submitted and approved by the responsible authority. When approved, the plans will be endorsed and then form a part of the permit. The plans mentioned above must include ~~the following~~:

- a) Fire Management Plan;
- b) Bushfire Risk Assessment, incorporating water supply requirements;
- c) Fuel Reduction and Maintenance Plan;
- d) Emergency Management Plan; ~~and~~
- e) Any other risk management information for the site.

~~Once endorsed the plans must be implemented to the satisfaction of the responsible authority.~~

9. Goulburn Broken Catchment Management Authority Requirements

The finished floor levels of the proposed Operations & Maintenance, Guard and Inverter buildings must be constructed at least 300 millimetres above general ground surface level, or higher level deemed necessary by the responsible authority.

10. Goulburn-Murray Water Requirements

- a) All construction and ongoing activities must be in accordance with sediment control principles outlined in 'Construction Techniques for Sediment Pollution Control' (EPA, 1991).
- b) All solar panels must be setback five metres from Goulburn-Murray Water's easement, freehold, or reserve boundary.
- c) The renewable energy facility must not impact the lease benefiting Goulburn-Murray Water on title (Titles Office Reference AF522022P).
- d) If applicable, all wastewater from the office must be treated and disposed of using an EPA approved system, installed, operated and maintained in compliance with the EPA Code of Practice – On-site Wastewater Management, Publication 891.4, and to the satisfaction of council's Environmental Health Department.
- e) If applicable, the wastewater disposal area must be located in accordance with Table 5 of the EPA Code of Practice – On-site Wastewater Management, Publication 891.4, July 2016, from any waterways, drainage lines, dams or bores.

11. Time for Starting and Completion Expiry

This permit will expire if one of the following ~~circumstances~~ applies:

- a) the development ~~and use has~~is not started within ~~two (2)~~ three (3) years of the date of this permit;
- b) the development is not completed within ~~four (4)~~ five (5) years of the date of this permit.

Appendix E Panel recommended Permit 2017-274

2017-274 - 235 Victoria Road, Tallygaroopna - X-Elio

1. Amended Plans Required

Before the development starts, amended plans to the satisfaction of the responsible authority must be submitted to and approved by the responsible authority. When approved, the plans will be endorsed and will then form part of the permit. The plans must be drawn to scale with dimensions and a minimum of three copies (or as specified) must be provided. Such plan must be generally in accordance with the plan submitted with the application but modified to show:

- (a) ~~A setback of the solar farm of not less than 50 metres to property boundaries~~
A setback of not less than 30 metres from the edge of the solar arrays to any adjoining property boundary
- (b) Detailed planning drawings of the development including floor and elevation plans of all proposed buildings
- (c) Location and details of the business identification signage
- (d) Details of any staging of the development.

Before the use of the solar ~~farm~~energy facility for a stage commences, all buildings and works ~~for that stage~~ as shown on the endorsed plans must be completed to the satisfaction of the responsible authority.

2. Layout Not Altered

The use and development of the land for a solar ~~farm~~energy facility as shown on the endorsed plans must not be altered without the written consent of the responsible authority.

The business identification signage to be erected must be in accordance with the endorsed plan and must not be altered or modified without the prior written approval of the responsible authority.

3. ~~Section 173 Agreement~~ Decommissioning plan

~~Prior to the use commencing, the owner must enter into an agreement with the Responsible Authority, pursuant to Section 173 of the Planning and Environment Act 1987 (the Act). This agreement must be registered on the title to the land pursuant to Section 181 of the Planning and Environment Act 1987. The owner must pay the reasonable costs of the preparation, execution and registration of the section 173 agreement. The agreement must provide for:~~

The following requirements must be met when the solar energy facility permanently ceases operation:

- (a) Within three months of the solar ~~farm~~energy facility use ending, a decommissioning ~~and rehabilitation~~ management plan prepared by a suitably qualified person must be submitted to the satisfaction of the responsible authority ~~for approval~~. When approved, the plan will be endorsed and will then form part of the permit. The plan must include but is not limited to:
 - (i) identification of structures to be removed, including but not limited to all solar panels, substation, buildings if they are not useful for ongoing use

- and electrical infrastructure, ~~including underground infrastructure to be removed~~ and how they will be removed;
- (ii) details of how the land will be rehabilitated back to ~~its pre-development condition to allow it to be used for agricultural purposes (or proposed alternative use)~~, ~~including irrigation layout and soil profile~~
- (b) Within 12 months of the endorsement of the decommissioning ~~and rehabilitation~~ management plan, ~~all~~ the decommissioning ~~and rehabilitation~~ must be completed to satisfaction of the responsible authority.
- (c) ~~The photovoltaic arrays (solar panels) must be orientated so that the panels are perpendicular to the ground within 30 minutes of sunset until within 30 minutes of sunrise to facilitate night radiant cooling.~~

~~The operator of the solar farm accepts and acknowledges that the solar farm operations may be subject to disturbance from agricultural activities including but not limited to spray drift, dust emissions and heavy machinery use.~~

~~The said agreement is to be prepared by Council. Council will undertake to have the agreement prepared upon written notification from the applicant. All costs associated with the preparation and registration of the agreement shall be borne by the applicant including Council's administration fee. All fees associated with the documentation must be fully paid prior to execution and registration of the document by Council.~~

4. **Civil Construction Requirements**

Before ~~any of~~ the development starts, detailed plans ~~with computations~~ to the satisfaction of the responsible authority must be submitted to and approved by the responsible authority. When approved, the plans will be endorsed and will then form part of the permit. The information submitted must show ~~the relevant~~ details listed in the council's Infrastructure Design Manual (IDM) and be designed in accordance with the requirements of that manual, ~~including:-~~

- (a) details (and computations) of how the works on the land are to be drained including drains conveying stormwater to the legal point of discharge;
- (b) details of how the drainage design allows for the continuation of existing overland flow paths across the land;
- (c) documentation demonstrating approval from the relevant authority for the legal point of discharge;
- (d) ~~maximum discharge rate shall not be more than 1.2 l/sec/ha;~~
- (e) carparking areas, circulation lanes and access shall be designed and constructed in accordance with AustRoads Publication 'Guide to Traffic Engineering Practice: Part 11 Parking,' 'Australian Standard AS2890.1-2004 (Off Street Parking)' & 'AS2890.6 (Off Street Parking for People with Disabilities);'
- (f) ~~the site shall be properly illuminated with lighting designed, baffled and located to the satisfaction of the responsible authority to prevent any adverse effect on adjoining land;~~
- (g) ~~details of how any lighting within the site is designed, baffled and located to~~

effectively illuminate all pertinent public areas, without spilling onto the road reserve or adjoining land, and must be connected to a time clock switch or other approved system to the satisfaction of the responsible authority

- (h) details on how noise emitted from the land during the operation of the facility will not exceed the recommended levels set out in EPA Publication 1411 Noise from Industry in Regional Victoria, 2011 as amended and replaced
- (i) details of the perimeter fencing of the land,
~~to the satisfaction of the responsible authority.~~

All parking spaces must be designed to allow all vehicles to drive forwards both when entering and leaving the property.

The access and parking areas must be constructed and drained to prevent diversion of flood or drainage waters, and well maintained ~~in a continuously useable condition~~ to the satisfaction of the responsible authority.

Parking spaces, access lanes and driveways must be kept available for these purposes at all times.

Before the operation of a stage of the solar farm energy facility commences, all buildings and works as shown on the endorsed plans must be constructed in accordance with the endorsed plans of that stage to the satisfaction of the responsible authority.

5. Landscape Plan

Before the development starts, three copies of a landscape plan must be submitted ~~prepared to and approved by the~~ satisfaction of the responsible authority. When approved, the plan will be endorsed and will then form part of the permit. The plan must be drawn to scale with dimensions and ~~three copies must be provided~~ must include:

- (a) a survey of all existing vegetation and natural features showing plants (greater than 1200mm diameter) to be removed;
- (b) a schedule of all proposed trees, shrubs and ground cover, including the location, number and size at maturity of all plants, the botanical names and the location of areas to be covered by grass, lawn or other surface materials as specified;
- (c) how the land under the solar arrays maintains good ground cover at a reasonable level and the management of the ground cover in the fire season;
- (d) details of permanent vegetation buffers with a minimum depth of seven metres and height of three metres at full maturity along any abutting residential property boundary to provide visual screening; ~~details of permanent screening trees and shrubs with a minimum of six rows using a mixture of local trees and understory species~~
- (e) details of vegetation buffers to provide screening to adjoining residences with a minimum width of seven metres and height of three metres;
- (f) a maintenance and monitoring program to ensure the ongoing health of the landscaping, including weed management and the replacement of dead or diseased plants.

All species selected must be to the satisfaction of the responsible authority.

Before the commencement of the use or by such a later date as is approved by the responsible authority in writing, landscaping works shown on the endorsed plan must be carried out and completed to the satisfaction of the responsible authority.

Once the landscaping planting is carried out the landscaping must be maintained including the replacement of any dead or diseased plants to the satisfaction of the responsible authority.

6. Construction Management Plan

Prior to commencement of works, a Construction Site Management Plan in accordance with Council's Infrastructure Design Manual must be prepared, approved and implemented to the satisfaction of the responsible authority. The plan must show:

- (a) measures to control erosion and sediment and sediment laden water runoff, including the design details of structures;
- (b) measures to retain dust, silt and debris on site, both during and after the construction phase;
- (c) locations of any construction wastes and the method of disposal, equipment, machinery and/or earth storage/stockpiling during construction;
- (d) where access to the site for construction vehicle traffic will occur;
- (e) tree protection zones;
- (f) the location of trenching works, boring, and pits associated with the provision of services; and
- (g) the location of any temporary buildings or yards
- (h) details of how the construction phase will comply with EPA Publication 1254, Noise Control Guidelines, 2011 as amended and replaced.

7. General Amenity

~~The use and development permitted by this permit must not, in the opinion of the responsible authority, adversely affect the amenity of the locality by reason of the processes carried on; the transportation of materials, goods or commodities to or from the subject land; the appearance of any buildings, works or materials; the emission of noise, artificial light, vibration, smell, fumes, smoke, vapour, steam, soot, ash, dust, waste water, waste products, grit, or oil; the presence of vermin, or otherwise.~~

~~Prior to the use commencing any security alarm installed on the premises must be 'silently wired' to a security firm or the Victoria Police.~~

Before the use commences, an Environmental Management Plan must be prepared, approved and implemented to the satisfaction of the responsible authority. The Environmental Management Plan must include:

- a) overall environmental objectives for the operation of the solar energy facility and techniques for their achievement;
- b) day-to-day management requirements for the use;
- c) procedures to ensure that no significant adverse environmental impacts occur as a result of the use;
- d) identification of possible risks of operational failure and response measures to be implemented; and
- e) a program for recording and reporting environmental incidents or non-compliances with

[this permit and for responding to complaints during operation of the solar energy facility.](#) Prior to the use commencing any lighting within the site must be designed, baffled and located in such positions so as to effectively illuminate all pertinent public areas, without spilling onto the road reserve or adjoining land, and must be connected to a time clock switch or other approved system to the satisfaction of the responsible authority.

8. Native Vegetation Offsets

Native vegetation offsets are required to offset the removal of three native scattered trees approved as part of this permit. The applicant must provide a native vegetation offset that meets the following requirements, and is in accordance with the *Permitted clearing of native vegetation – Biodiversity assessment guidelines 2013* and the *Native vegetation gain scoring manual (Department of Environment and Primary Industries) 2013*:

The offset must:

- a) contribute gain of at least 0.018 biodiversity equivalence units
- b) be located within the Goulburn Broken Catchment Management Authority boundary or Greater Shepparton City Council Municipal district
- c) have a strategic biodiversity score of at least 0.278

Native Vegetation Offset Evidence

Before any native vegetation is removed, evidence that an offset has been secured must be provided to the satisfaction of and approved by the Responsible Authority. This offset must meet the offset requirements set out in this permit and be in accordance with the requirements of the *Permitted clearing of native vegetation – Biodiversity assessment guidelines* and the *Native vegetation gain scoring manual 2013* (Department of Environment and Primary Industries).

Offset evidence can be either:

- (a) An allocated native vegetation credit register extract from the Native Vegetation Credit Register; or
- (b) A security agreement to the required standard for the offset site or sites, including a 10-year Offset Management Plan to the satisfaction and approval of the Responsible Authority.

Every year, for ten years from the date of approval of the Offset Management Plan, the applicant must provide to the Responsible Authority, notification of actions undertaken towards implementation of the Offset Management Plan, an offset site condition statement and site monitoring photographs.

The Offset Management Plan must be in accordance with *Permitted clearing of native vegetation; First party general offset kit* (Department of Environment and Primary Industries) and include:

- (a) The gain in biodiversity equivalence units and strategic biodiversity score to be achieved by the offset actions
- (b) Location of where offsets are to be provided and size of area (to be drawn to scale)
- (c) Type of offsets to be provided

- (d) If applicable, revegetation details including the method(s), number of trees, shrubs and other plants, species, mix and density
- (e) Activities that will be forgone within the offset area, such as grazing, removal of fallen timber and standing trees and other development/uses
- (f) Management actions that will be undertaken to ensure long term sustainability of offset(s) such as permanent fencing, weed control, revegetation maintenance, retention of timber/branches and other habitat management actions
- (g) Method of permanent protection for offset(s) such as a formal agreement
- (h) Person(s) responsible for implementing and monitoring the Offset Management Plan
- (i) Time frame for implementing the Offset Management Plan

No alteration to Offset requirements

The requirements noted in an approved and endorsed Offset Plan must not be altered without the written consent of the responsible authority.

9. Fire and Emergency Management Plans

Before the development starts, plans must be prepared to the satisfaction of the responsible authority having regard to the requirements of the Country Fire Authority and must be submitted and approved by the responsible authority. When approved, the plans will be endorsed and then form a part of the permit. The plans mentioned above must include:

- (a) Fire Management Plan
- (b) Bushfire Risk Assessment, incorporating water supply requirements
- (c) Fuel Reduction and Maintenance Plan
- (d) Emergency Management Plan
- (e) Any other risk management information for the site.

10. Goulburn-Murray Water Requirements

- (a) All construction and ongoing activities must be in accordance with sediment control principles outlined in 'Construction Techniques for Sediment Pollution Control' (EPA, 1991).
- (b) All solar panels must be setback at least ten metres from Goulburn-Murray Water's East Goulburn 4/18 Channel.
- (c) If applicable, all wastewater from the office must be treated and disposed of using an EPA approved system, installed, operated and maintained in compliance with the EPA Code of Practice – On-site Wastewater Management, Publication 891.4, and to the satisfaction of Council's Environmental Health Department.
- (d) If applicable, the wastewater disposal area must be located in accordance with Table 5 of the EPA Code of Practice – On-site Wastewater Management, Publication 891.4, July 2016, from any waterways (including Goulburn-Murray

Water open channels), drainage lines, dams or bores.

11. **Powercor Requirements**

The applicant shall:

- (a) Negotiate with Powercor for the connection of the development, to the existing power distribution network.
- (b) Any buildings must comply with the clearances required by the Electricity Safety (Installations) Regulations.
- (c) Any construction work must comply with Energy Safe Victoria's "No Go Zone" rules.
- (d) Set aside for the use of Powercor Australia Ltd reserves and/or easements satisfactory to Powercor Australia Ltd where any electric substation (other than a pole mounted type) is required.
- (e) Alternatively, at the discretion of Powercor Australia Ltd a lease(s) of the site(s) and for easements for associated powerlines, cables and access ways shall be provided. Such a lease shall be for a period of 30 years at a nominal rental with a right to extend the lease for a further 30 years. Powercor Australia Ltd will register such leases on the title by way of a caveat prior to the registration of the plan of subdivision.
- (f) Provide easements satisfactory to Powercor Australia Ltd, where easements have not been otherwise provided, for all existing Powercor Australia Ltd electric lines on the land and for any new powerlines required to service the lots and adjoining land, save for lines located, or to be located, on public roads set out on the plan. These easements shall show on the plan an easement(s) in favour of "Powercor Australia Ltd" for "Power Line" pursuant to Section 88 of the Electricity Industry Act 2000.
- (g) Obtain for the use of Powercor Australia Ltd any other easement external to the development.

12. **Time for Starting and Completion Expiry**

This permit will expire if one of the following ~~circumstances~~ applies:

- (a) the development ~~and use has~~ not started within ~~two (2)~~ three (3) years of the date of this permit;
- (b) the development is not completed within ~~four (4)~~ six (6) years of the date of this permit.

Appendix F Panel recommended Permit 2017-301

2017-301 - 1190 Cosgrove-Lemnos Road, 1220 Cosgrove-Lemnos Road, 260 Tank Corner East Road, 875 Boundary Road and 85 Crooked Lane - Neoen

1. Amended Plans Required

Before the development starts, amended plans to the satisfaction of the responsible authority must be submitted to and approved by the responsible authority. When approved, the plans will be endorsed and will then form part of the permit. The plans must be drawn to scale with dimensions and a minimum of two copies (or as specified) must be provided. The plans must be generally in accordance with the plans submitted with the application but modified to include any necessary information listed in Council's Infrastructure Design Manual. The plans must show:

- (a) ~~Plans to show the solar arrays are setback at least 50 metres from the lands boundary~~
- (b) A setback of not less than 30 metres from the edge of the solar arrays to any adjoining property boundary
- (c) A detailed fencing plan that ~~achieves compliance~~ with the Goulburn Broken Catchment Management Authority conditions
- (d) Floor and elevation plans of all proposed buildings
- (e) Setbacks of buildings and solar panels ~~thate~~ comply with Goulburn-Murray Water conditions
- (f) Details of the water tanks and associated screening (Tank Corner East Road)

Before the operation of the solar farm energy facility, all buildings and works shown on the endorsed plans must be completed to the satisfaction of the responsible authority.

2. Layout Not Altered

The use and development of the land for a solar farm energy facility as shown on the endorsed plans must not be altered without the written consent of the responsible authority.

3. Section 173 Agreement Decommissioning plan

~~Prior to the use commencing, the owner must enter into an agreement with the Responsible Authority, pursuant to Section 173 of the Planning and Environment Act 1987 (the Act). This agreement must be registered on the title to the land pursuant to Section 181 of the Planning and Environment Act 1987. The owner must pay the reasonable costs of the preparation, execution and registration of the section 173 agreement. The agreement must provide for:~~

The following requirements must be met when the solar energy facility permanently ceases operation:

- (a) Within three months of the solar farm energy facility use ending, a decommissioning ~~and rehabilitation~~ management plan prepared by a suitably qualified person must be submitted to the satisfaction of the responsible authority for approval. When approved, the plan will be endorsed and will the

form part of the permit. The plan must include but is not limited to:

- (i) identification of structures to be removed, including but not limited to all solar panels, substation, buildings (if they are not useful for ongoing use) and electrical infrastructure, ~~including underground infrastructure to be removed~~ and how they will be removed;
- (ii) details of how the land will be rehabilitated ~~back to its pre-development condition~~ allow it to be used for agricultural purposes (or proposed alternative use), ~~including irrigation layout and soil profile~~
- (c) Within 12 months of the endorsement of the decommissioning ~~and rehabilitation~~ management plan, ~~all the decommissioning and rehabilitation~~ must be completed to satisfaction of the responsible authority.
- (d) ~~The photovoltaic arrays (solar panels) must be orientated so that the panels are perpendicular to the ground within 30 minutes of sunset until within 30 minutes of sunrise to facilitate night radiant cooling.~~
- (e) ~~The operator of the solar farm accepts and acknowledges that the solar farm operations may be subject to disturbance from agricultural activities including but not limited to spray drift, dust emissions and heavy vehicle use.~~

~~The said agreement is to be prepared by Council. Council will undertake to have the agreement prepared upon written notification from the applicant. All costs associated with the preparation and registration of the agreement shall be borne by the applicant including Council's administration fee. All fees associated with the documentation must be fully paid prior to execution and registration of the document by Council.~~

4. Civil Construction Requirements

Before ~~any of~~ the development starts, detailed plans ~~with computations~~ to the satisfaction of the responsible authority must be submitted to and approved by the responsible authority. When approved, the plans will be endorsed and will then form part of the permit. The information submitted must show ~~the any relevant~~ details listed in the Council's Infrastructure Design Manual (IDM) and be designed in accordance with the requirements of that manual including:-

- a) details (and computations) of how the works on the land are to be drained including drains conveying stormwater to the legal point of discharge;
- b) details of how the drainage design allows for the continuation of existing overland flow paths across the land;
- c) documentation demonstrating approval from the relevant authority for the legal point of discharge;
- d) ~~maximum discharge rate shall not be more than 1.2 l/sec/ha;~~
- e) detailed plans of the proposed vehicle crossing from Cosgrove-Lemnos Road (labelled main entrance on the plans);
- f) carparking areas, circulation lanes and access shall be designed and constructed in accordance with AustRoads Publication 'Guide to Traffic Engineering Practice:-

Part 11 Parking,' 'Australian Standard AS2890.1-2004 (Off Street Parking)' & 'AS2890.6 (Off Street Parking for People with Disabilities);'

- (f) ~~the site shall be properly illuminated with lighting designed, baffled and located to the satisfaction of the responsible authority to prevent any adverse effect on adjoining land;~~
- g) details of how any lighting within the site is designed, baffled and located to effectively illuminate all pertinent public areas, without spilling onto the road reserve or adjoining land, and connection to a time clock switch or other approved system;
- h) details on how noise emitted from the land during the operation of the facility will not exceed the recommended levels set out in EPA Publication 1411 Noise from Industry in Regional Victoria, 2011 as amended and replaced;
- i) details of the perimeter fencing of the land,
~~to the satisfaction of the responsible authority.~~

All parking spaces must be designed to allow all vehicles to drive forwards both when entering and leaving the property.

The access and parking areas must be constructed and drained to prevent diversion of flood or drainage waters, and well maintained ~~in a continuously useable condition~~ to the satisfaction of the responsible authority.

Parking spaces, access lanes and driveways must be kept available for these purposes at all times.

Before the operation of the solar farm-energy facility commences, all buildings and works as shown on the endorsed plans must be constructed in accordance with the endorsed plans to the satisfaction of the responsible authority.

5. Landscape Plan

Before the development starts, three copies of a landscape plan must be submitted to and approved by the responsible authority. When approved, the plan will be endorsed and will then form part of the permit. The plan must be drawn to scale with dimensions and must include: ~~three copies must be provided;~~

- a) a survey of all existing vegetation and natural features showing plants (greater than 1200mm diameter) to be removed;
- b) a schedule of all proposed trees, shrubs and ground cover, including the location, number and size at maturity of all plants, the botanical names and the location of areas to be covered by grass, lawn or other surface materials as specified;
- c) ~~how the land under the solar arrays maintains ground cover at a reasonable level and the management of fire risk;~~
- d) details of permanent vegetation buffers with a minimum depth of seven metres and height of three metres at full maturity along any abutting residential property boundary to provide visual screening; ~~details of permanent screening trees and shrubs with a minimum of six rows using a mixture of local trees and understorey species~~
- e) a maintenance and monitoring program to ensure the ongoing health of the landscaping, including weed management and the replacement of dead or diseased plants.

All species selected must be to the satisfaction of the responsible authority.

Before the commencement of the use or by such a later date as is approved by the responsible authority in writing, landscaping works shown on the endorsed plan must be carried out and completed to the satisfaction of the responsible authority.

Once the landscaping planting is carried out the landscaping must be maintained including the replacement of any dead or diseased plants to the satisfaction of the responsible authority.

6. Construction Management Plan

Prior to commencement of works, a Construction Site Management Plan in accordance with Council's Infrastructure Design Manual must be prepared, approved and implemented to the satisfaction of the responsible authority. The plan must show:

- a) measures to control erosion and sediment and sediment laden water runoff, including the design details of structures;
- b) measures to retain dust, silt and debris on site, both during and after the construction phase;
- c) locations of any construction wastes and the method of disposal, equipment, machinery and/or earth storage/stockpiling during construction;
- d) where access to the site for construction vehicle traffic will occur;
- e) tree protection zones;
- f) the location of trenching works, boring, and pits associated with the provision of services;
- g) the location of any temporary buildings or yards;
- h) measures to ensure conflicts between cyclists and construction activities are managed;
- i) submission of written approval from AusNet Services to use vehicles and equipment exceeding 3 metres in height on the AusNet easement
- j) details of how the construction phase will comply with EPA Publication 1254, Noise Control Guidelines, 2011 as amended and replaced.

7. General Amenity

~~The use and development permitted by this permit must not, in the opinion of the responsible authority, adversely affect the amenity of the locality by reason of the processes carried on; the transportation of materials, goods or commodities to or from the subject land; the appearance of any buildings, works or materials; the emission of noise, artificial light, vibration, smell, fumes, smoke, vapour, steam, soot, ash, dust, waste water, waste products, grit, or oil; the presence of vermin, or otherwise.~~

Prior to the use commencing, an Environmental Management Plan must be prepared, approved and implemented to the satisfaction of the responsible authority. The Environmental Management Plan must include:

- a) overall environmental objectives for the operation of the solar energy facility and techniques for their achievement
- b) day-to-day management requirements for the use
- c) procedures to ensure that no significant adverse environmental impacts occur as a result of the use
- d) identification of possible risks of operational failure and response measures to be implemented
- e) a program for recording and reporting environmental incidents or non-compliances with this permit and for responding to complaints during operation of the solar energy facility.

~~Prior to the use commencing any security alarm installed on the premises must be 'silently~~

~~wired' to a security firm or the Victoria Police.~~

~~Prior to the use commencing any lighting within the site must be designed, baffled and located in such positions so as to effectively illuminate all pertinent public areas, without spilling onto the road reserve or adjoining land, and must be connected to a time clock switch or other approved system to the satisfaction of the responsible authority.~~

8. Native Vegetation Offsets

Native vegetation offsets are required to offset the removal of 22 native scattered trees approved as part of this permit. The applicant must provide a native vegetation offset that meets the following requirements, and is in accordance with the *Permitted clearing of native vegetation – Biodiversity assessment guidelines 2013* and the *Native vegetation gain scoring manual (Department of Environment and Primary Industries) 2013*:

The offset must:

- (b) contribute gain of at least 0.059 biodiversity equivalence units
- (g) be located within the Goulburn Broken Catchment Management Authority boundary or Greater Shepparton City Council Municipal district
- (h) have a strategic biodiversity score of at least 0.101

Native Vegetation Offset Evidence

Before any native vegetation is removed, evidence that an offset has been secured must be provided to the satisfaction of and approved by the Responsible Authority. This offset must meet the offset requirements set out in this permit and be in accordance with the requirements of the *Permitted clearing of native vegetation – Biodiversity assessment guidelines and the Native vegetation gain scoring manual (Department of Environment and Primary Industries) 2013*.

Offset evidence can be either:

- (c) An allocated native vegetation credit register extract from the Native Vegetation Credit Register; or
- (i) A security agreement to the required standard for the offset site or sites, including a 10-year Offset Management Plan to the satisfaction and approval of the Responsible Authority.

Every year, for ten years from the date of approval of the Offset Management Plan, the applicant must provide to the Responsible Authority, notification of actions undertaken towards implementation of the Offset Management Plan, an offset site condition statement and site monitoring photographs.

The Offset Management Plan must be in accordance with *Permitted clearing of native vegetation; First party general offset kit (Department of Environment and Primary Industries)* and include:

- (a) The gain in biodiversity equivalence units and strategic biodiversity score to be achieved by the offset actions
- (b) Location of where offsets are to be provided and size of area (to be drawn to scale)

- (c) Type of offsets to be provided
- (d) If applicable, revegetation details including the method(s), number of trees, shrubs and other plants, species, mix and density
- (e) Activities that will be forgone within the offset area, such as grazing, removal of fallen timber and standing trees and other development/uses
- (f) Management actions that will be undertaken to ensure long term sustainability of offset(s) such as permanent fencing, weed control, revegetation maintenance, retention of timber/branches and other habitat management actions
- (g) Method of permanent protection for offset(s) such as a formal agreement
- (h) Person(s) responsible for implementing and monitoring the Offset Management Plan
- (i) Time frame for implementing the Offset Management Plan

No alteration to Offset requirements

The requirements noted in an approved and endorsed Offset Plan must not be altered without the written consent of the responsible authority.

9. ~~Country Fire Authority Requirements~~ Fire and Emergency Management Plans

Before the development starts, plans must be prepared to the satisfaction of the responsible authority having regard to the requirements of CFA—the Country Fire Authority ~~must be submitted and approved by CFA and the responsible authority~~. When approved, the plans will be endorsed and then form a part of the permit. The plans mentioned above must include ~~the following~~:

- (a) Fire Management Plan;
- (b) Bushfire Risk Assessment, incorporating water supply requirements;
- (c) Fuel Reduction and Maintenance Plan;
- (d) Emergency Management Plan; ~~and~~
- (e) Any other risk management information for the site.

10. Goulburn-Murray Water Requirements

- a) No buildings other than the solar panels are to be constructed within 30 metres of OKeefe Creek ~~and or~~ Goulburn-Murray Water's open channels ~~and drains~~ (no. 14A, 7/14A, 15) and drains (no. 6/11, 8/4), or within the Floodway Overlay (FO).
- b) No solar panels (or associated works) are to be constructed within 30 metres of Goulburn-Murray Water's drains no. 6/11 and 8/4. All other solar panels must be setback at least five metres from Goulburn-Murray Water's easements, freehold or reserves containing Goulburn-Murray Water infrastructure.
- c) Prior to commencement of works, the applicant must obtain a 'Construction and Use of Private Works Licence' from Goulburn-Murray Water for any works carried out on Goulburn-Murray Water freehold land, easement or reserves.
- d) All construction and ongoing activities must be in accordance with sediment control principles outlined in 'Construction Techniques for Sediment Pollution Control' (EPA,

1991).

11. AusNet Services

- a) The plan must show the AusNet Transmission Group easement fully dimensioned.
- b) No part of the proposed development is permitted on AusNet Transmission Group's easement unless otherwise agreed to in writing by AusNet Transmission Group.
- c) Access to and along the easement must be maintained at all times for AusNet Transmission Group's vehicles, staff and contractors.
- d) Natural ground surface levels on the easement must not be altered by the stockpiling of excavated material or by landscaping without prior written approval from AusNet Transmission Group.
- e) The use of vehicles and equipment exceeding 3 metres in height are not permitted to operate on the easement without prior written approval from AusNet Transmission Group.
- f) Approval must be obtained from AusNet Transmission Group as to the position and/or suitability of any roads that are proposed within the easement.
- g) Details of any proposed services within the easement must be submitted to AusNet Transmission Group and approved in writing prior to the commencement of work on site.

12. Goulburn Broken Catchment Management Authority Requirements

- a) The finished floor levels of the proposed substation, control room and O & M building must be constructed at least 300 millimetres above the applicable 100-year ARI flood level of 115.2 metres AHD, i.e. 115.5 metres AHD, or higher level deemed necessary by the responsible authority.
- b) ~~A 200 metres length of fencing~~ Any fencing constructed along the Cosgrove-Lemnos Road and within the Rural Floodway Overlay, must be constructed as post and wire or post and rail farm type fencing. ~~Alternatively, pool type fencing with vertical bars spaced at least 150 millimetres apart.~~
- c) ~~A 200 metres length of fencing~~ Any fencing constructed along the western boundary of the property, and immediately north of the Goulburn Murray Channel 7A/14, within the Rural Floodway Overlay, must be constructed as post and wire or post and rail farm type fencing. ~~Alternatively, pool type fencing with vertical bars spaced at least 150 millimetres apart.~~

13. Time for Starting and Completion Expiry

This permit will expire if one of the following ~~circumstances~~ applies:

- a) the development ~~and use is~~ has not started within **two (2) years** of the date of this permit;
- b) the development is not completed within **four (4) years** of the date of this permit.

Appendix G Panel recommended Permit 2017-344

2017-344 - 1090 Lemnos North Road, Congupna - X-Elio

1. Amended Plans Required

Before the development starts, amended plans to the satisfaction of the responsible authority must be submitted to and approved by the responsible authority. When approved, the plans will be endorsed and will then form part of the permit. The plans must be drawn to scale with dimensions and a minimum of two copies (or as specified) must be provided. The plans must be generally in accordance with the plans submitted with the application but modified to include any necessary information listed in Council's Infrastructure Design Manual and must show:-

- (a) ~~Plans to show the solar arrays are setback at least 50 metres from the lands boundary~~ A setback of not less than 30 metres from the edge of the solar arrays to any adjoining property boundary
- (b) A detailed fencing plan that ~~achieves compliance~~ complies with the Goulburn Broken Catchment Management Authority conditions
- (c) Floor and elevation plans of all proposed buildings
- (d) Setbacks of buildings and solar panel to comply with Goulburn-Murray Water conditions
- (e) Location and dDetails of the business identification signage.

2. Layout Not Altered

The use and development of the land for a solar energy facility as shown on the endorsed plans must not be altered without the written consent of the responsible authority.

3. Decommissioning plan Section 173 Agreement

~~Prior to the use commencing, the owner must enter into an agreement with the Responsible Authority, pursuant to Section 173 of the Planning and Environment Act 1987 (the Act). This agreement must be registered on the title to the land pursuant to Section 181 of the Planning and Environment Act 1987. The owner must pay the reasonable costs of the preparation, execution and registration of the section 173 agreement. The agreement must provide for:~~

The following requirements must be met when the solar energy facility permanently ceases operation:

- (a) Within three months of the solar ~~farm~~ energy facility use ending, a decommissioning ~~and rehabilitation~~ management plan prepared by a suitably qualified person must be submitted to the satisfaction of the responsible authority ~~for approval~~. When approved, the endorsed plan will be endorsed and will then form part of the permit. The plan must include but is not limited to:
 - (i) identification of structures to be removed, including but not limited to all solar panels, substation, buildings (if they are not useful for ongoing use) and electrical infrastructure, ~~including underground infrastructure to be removed and how they will be removed~~ and how it will be removed;
 - (ii) details of how the land will be rehabilitated ~~back to its pre-development~~

~~condition allow it to be used for agricultural purposes (or proposed alternative use), including irrigation layout and soil profile~~

Within 12 months of the endorsement of the decommissioning ~~and rehabilitation~~ management plan, ~~all~~ the decommissioning ~~and rehabilitation~~ must be completed to satisfaction of the responsible authority.

- (a) ~~The photovoltaic arrays (solar panels) must be orientated so that the panels are perpendicular to the ground within 30 minutes of sunset until within 30 minutes of sunrise to facilitate night radiant cooling.~~
- (b) ~~The operator of the solar farm accepts and acknowledges that the use and development may be subject to disturbance from agricultural activities including but not limited to spray drift, dust emissions and heavy machinery use~~

~~The said agreement is to be prepared by Council. Council will undertake to have the agreement prepared upon written notification from the applicant. All costs associated with the preparation and registration of the agreement shall be borne by the applicant including Council's administration fee. All fees associated with the documentation must be fully paid prior to execution and registration of the document by Council.~~

4. Civil Construction Requirements

Before ~~any of~~ the development ~~of any relevant stage~~ starts, detailed plans ~~with computations~~ to the satisfaction of the responsible authority ~~for the relevant stage~~ must be submitted to and approved by the responsible authority. When approved, the plans will be endorsed and will then form part of the permit. The information submitted must show ~~the any relevant~~ details listed in the Council's Infrastructure Design Manual (IDM) and be designed in accordance with the requirements of that manual ~~including:~~

- (a) details (and computations) of how the works on the land are to be drained including drains conveying stormwater to the legal point of discharge;
- (b) details of how the drainage design allows for the continuation of existing overland flow paths across the land;
- (c) documentation demonstrating approval from the relevant authority for the legal point of discharge;
- (d) ~~maximum discharge rate shall not be more than 1.2 l/sec/ha;~~
- (e) detailed plans of the vehicle crossing from Lemnos North Road to the site office area;
- (f) carparking areas, circulation lanes and access shall be designed and constructed in accordance with AustRoads Publication 'Guide to Traffic Engineering Practice: Part 11 Parking,' 'Australian Standard AS2890.1-2004 (Off Street Parking)' & 'AS2890.6 (Off Street Parking for People with Disabilities);'
- (g) ~~details of how any lighting within the site is designed, baffled and located to effectively illuminate all pertinent public areas, without spilling onto the road reserve or adjoining land, and connection to a time clock switch or other approved system;~~
- (h) ~~details on how noise emitted from the land during the operation of the facility~~

will not exceed the recommended levels set out in EPA Publication 1411 Noise from Industry in Regional Victoria, 2011 as amended and replaced;

- (i) ~~the site shall be properly illuminated with lighting designed, baffled and located to the satisfaction of the responsible authority to prevent any adverse effect on adjoining land;~~
- (j) details of the perimeter fencing of the land,

~~to the satisfaction of the responsible authority.~~

All parking spaces must be designed to allow all vehicles to drive forwards both when entering and leaving the property.

The access and parking areas must be constructed and drained to prevent diversion of flood or drainage waters, and maintained in a continuously useable condition to the satisfaction of the responsible authority.

Parking spaces, access lanes and driveways must be kept available for these purposes at all times.

Before the operation of a stage of the solar farm-energy facility commences, all buildings and works as shown on the endorsed plans must be constructed in accordance with the endorsed plans of that stage to the satisfaction of the responsible authority.

5. Landscape Plan

Before the development starts, three copies of a landscape plan must be submitted-prepared to and approved by the satisfaction of the responsible authority. When approved, the plan will be endorsed and will then form part of the permit. The plan must be drawn to scale with dimensions and ~~three copies must include: be provided;~~

- (a) a survey of all existing vegetation and natural features showing plants (greater than 1200mm diameter) to be removed;
- (b) a schedule of all proposed trees, shrubs and ground cover, including the location, number and size at maturity of all plants, the botanical names and the location of areas to be covered by grass, lawn or other surface materials as specified;
- (c) how the land under the solar arrays maintains ground cover at a reasonable level and the management of fire risk;
- (d) ~~details of permanent screening trees and shrubs with a minimum of six rows using a mixture of local trees and understorey species~~
- (e) details of vegetation buffers to provide screening to adjoining residences with a minimum width of seven metres and height of three metres;
- (f) a maintenance and monitoring program to ensure the ongoing health of the landscaping, including weed management and the replacement of dead or diseased plants.

All species selected must be to the satisfaction of the responsible authority.

Before the commencement of the use or by such a later date as is approved by the responsible authority in writing, landscaping works shown on the endorsed plan must be carried out and completed to the satisfaction of the responsible authority.

Once the landscaping planting is carried out the landscaping must be maintained including the

replacement of any dead or diseased plants to the satisfaction of the responsible authority.

6. Construction Management Plan

Prior to commencement of works, a Construction Site Management Plan in accordance with Council's Infrastructure Design Manual must be prepared, approved and implemented to the satisfaction of the responsible authority. The plan must show:

- (a) measures to control erosion and sediment and sediment laden water runoff, including the design details of structures;
- (b) measures to retain dust, silt and debris on site, both during and after the construction phase;
- (c) locations of any construction wastes and the method of disposal, equipment, machinery and/or earth storage/stockpiling during construction;
- (d) where access to the site for construction vehicle traffic will occur;
- (e) tree protection zones;
- (f) the location of trenching works, boring, and pits associated with the provision of services;
- (g) the location of any temporary buildings or yards
- (h) details of how the construction phase will comply with EPA Publication 1254, Noise Control Guidelines, 2011 as amended and replaced.

7. General Amenity

~~The use and development permitted by this permit must not, in the opinion of the responsible authority, adversely affect the amenity of the locality by reason of the processes carried on; the transportation of materials, goods or commodities to or from the subject land; the appearance of any buildings, works or materials; the emission of noise, artificial light, vibration, smell, fumes, smoke, vapour, steam, soot, ash, dust, waste water, waste products, grit, or oil; the presence of vermin, or otherwise.~~

~~Prior to the use commencing any security alarm installed on the premises must be 'silently wired' to a security firm or the Victoria Police.~~

~~Prior to the use commencing any lighting within the site must be designed, baffled and located in such positions so as to effectively illuminate all pertinent public areas, without spilling onto the road reserve or adjoining land, and must be connected to a time clock switch or other approved system to the satisfaction of the responsible authority.~~

Before the use commences, an Environmental Management Plan must be prepared, approved and implemented to the satisfaction of the responsible authority. The Environmental Management Plan must include:

- a) overall environmental objectives for the operation of the solar energy facility and techniques for their achievement;
- b) day-to-day management requirements for the use;
- c) procedures to ensure that no significant adverse environmental impacts occur as a result of the use;
- d) identification of possible risks of operational failure and response measures to be implemented; and

- e) [a program for recording and reporting environmental incidents or non-compliances with this permit and for responding to complaints during operation of the solar energy facility.](#)

8. Native Vegetation Offsets

Native vegetation offsets are required to offset the removal of 6 native scattered trees approved as part of this permit. The applicant must provide a native vegetation offset that meets the following requirements, and is in accordance with the *Permitted clearing of native vegetation – Biodiversity assessment guidelines and the Native vegetation gain scoring manual (Department of Environment and Primary Industries)*:

The offset must:

- (a) contribute gain of at least 0.101 biodiversity equivalence units
- (b) be located within the Goulburn Broken Catchment Management Authority boundary or Greater Shepparton City Council Municipal district
- (c) have a strategic biodiversity score of at least 0.406

Native Vegetation Offset Evidence

Before any native vegetation is removed, evidence that an offset has been secured must be provided to the satisfaction of and approved by the Responsible Authority. This offset must meet the offset requirements set out in this permit and be in accordance with the requirements of the *Permitted clearing of native vegetation – Biodiversity assessment guidelines 2013 and the Native vegetation gain scoring manual (Department of Environment and Primary Industries) 2013*.

Offset evidence can be either:

- a) An allocated native vegetation credit register extract from the Native Vegetation Credit Register; or
- b) A security agreement to the required standard for the offset site or sites, including a 10-year Offset Management Plan to the satisfaction and approval of the Responsible Authority.

Every year, for ten years from the date of approval of the Offset Management Plan, the applicant must provide to the Responsible Authority, notification of actions undertaken towards implementation of the Offset Management Plan, an offset site condition statement and site monitoring photographs.

The Offset Management Plan must be in accordance with *Permitted clearing of native vegetation; First party general offset kit (Department of Environment and Primary Industries)* and include:

- (a) The gain in biodiversity equivalence units and strategic biodiversity score to be achieved by the offset actions
- (b) Location of where offsets are to be provided and size of area (to be drawn to scale)
- (c) Type of offsets to be provided
- (d) If applicable, revegetation details including the method(s), number of trees,

shrubs and other plants, species, mix and density

- (e) Activities that will be forgone within the offset area, such as grazing, removal of fallen timber and standing trees and other development/uses
- (f) Management actions that will be undertaken to ensure long term sustainability of offset(s) such as permanent fencing, weed control, revegetation maintenance, retention of timber/branches and other habitat management actions
- (g) Method of permanent protection for offset(s) such as a formal agreement
- (h) Person(s) responsible for implementing and monitoring the Offset Management Plan
- (i) Time frame for implementing the Offset Management Plan

No alteration to Offset requirements

The requirements noted in an approved and endorsed Offset Plan must not be altered without the written consent of the responsible authority.

9. ~~Country Fire Authority Requirements~~ Fire and Emergency Management Plans

Before the development starts, plans must be prepared to the satisfaction of the responsible authority having regard to the requirements of the Country Fire Authority CFA and must be submitted and approved by CFA and the responsible authority. When approved, the plans will be endorsed and then form a part of the permit. The plans mentioned above must include ~~the following:~~

- (a) Fire Management Plan;
- (b) Bushfire Risk Assessment, incorporating water supply requirements;
- (c) Fuel Reduction and Maintenance Plan;
- (d) Emergency Management Plan; ~~and~~
- (e) Any other risk management information for the site.

10. Goulburn-Murray Water Requirements

- (a) All construction and ongoing activities must be in accordance with sediment control principles outlined in 'Construction Techniques for Sediment Pollution Control' (EPA, 1991).
- (b) No buildings and solar panels (including works associated with solar panels) are to be constructed within 30 metres of the Congupna Creek or within the Floodway Overlay in the north east corner of the subject land.
- (c) No buildings are to be constructed within the Floodway Overlay in the southwest corner of the subject land. 'Buildings' does not include solar panels or works associated with solar panels.

11. Goulburn Broken Catchment Management Authority Requirements

- (a) The finished floor levels of the proposed substation and site office must be constructed at least 300 millimetres above the adjacent centreline road levels of

the Katamatite-Shepparton Main Road, or higher level deemed necessary by the responsible authority.

- (b) The Floodway Overlay at the north-east corner of the property may be fenced on the Overlay's western boundary only.

12. Powercor Requirements

The applicant shall:

- (a) Negotiate with Powercor for the connection of the development, to the existing power distribution network.
- (b) Any buildings must comply with the clearances required by the Electricity Safety (Installations) Regulations.
- (c) Any construction work must comply with Energy Safe Victoria's "No Go Zone" rules.
- (d) Set aside for the use of Powercor Australia Ltd reserves and/or easements satisfactory to Powercor Australia Ltd where any electric substation (other than a pole mounted type) is required.

Alternatively, at the discretion of Powercor Australia Ltd a lease(s) of the site(s) and for easements for associated powerlines, cables and access ways shall be provided. Such a lease shall be for a period of 30 years at a nominal rental with a right to extend the lease for a further 30 years. Powercor Australia Ltd will register such leases on the title by way of a caveat prior to the registration of the plan of subdivision.

- (a) Provide easements satisfactory to Powercor Australia Ltd, where easements have not been otherwise provided, for all existing Powercor Australia Ltd electric lines on the land and for any new powerlines required to service the lots and adjoining land, save for lines located, or to be located, on public roads set out on the plan. These easements shall show on the plan an easement(s) in favour of "Powercor Australia Ltd" for "Power Line" pursuant to Section 88 of the Electricity Industry Act 2000.
- (b) Obtain for the use of Powercor Australia Ltd any other easement external to the development.

13. Time for Starting and Completion Expiry

This permit will expire if one of the following ~~circumstances~~ applies:

- (a) the development ~~and use has~~ not started within ~~two (2)~~ three (3) years of the date of this permit;
- (b) the development is not completed within ~~four (4)~~ six (6) years of the date of this permit.

DRAFT SUBMISSION TO SOLAR ENERGY FACILITIES GUIDELINES**Do the draft Guidelines provide relevant and helpful guidance for siting, design and development of solar energy facilities?**

Yes, however the guidelines seem designed to provide guidance mainly to proponents or applicants. It would be useful to include a section for planning officers who are assessing these types of applications. While this section may largely be a duplication of information located elsewhere in the document it would help provide certainty for officers and avoid delays in the assessment process. This section could include:

- How to assess adequate siting and design
- How to ensure operational requirements are considered and addressed by conditions of any planning permit issued.
- Guidance on how to balance the loss of agricultural land with the benefit of renewable energy supply.
- How to adequately assess the potential amenity impacts including impacts on the rural landscape and loss of native vegetation.

Do the draft Guidelines include sufficient advice on approval requirements for solar energy facilities?

Generally yes, however a set of model planning permit conditions based on the recent planning permit approval granted by the Minister would be beneficial in ensuring decision making consistency across the state.

Do the draft Guidelines include enough information on best practice solar energy facility siting, design and operational matters?

Generally yes, however additional information in relation to fire management requirements for these facilities would be beneficial. The requirement for an applicant to prepare and submit a fire management plan that meets CFA requirements would help address this and provide certainty to all stakeholders. The guidelines should provide clear detail on the information to be provided in the plan including any relevant standards that are required to be met.

Do you have any other general comments about the draft Guidelines?

Council is generally supportive of the guidelines as they address the key issues identified in the recent Planning Panel Report in relation to applications for solar energy facilities within the Greater Shepparton City Council. With the inclusion of the information above the guidelines would provide a document that provides certainty to all stakeholders involved in the process.

The guidelines would also benefit from any standard condition in relation to the decommissioning of facilities requiring evidence of how the decommissioned structures and panels will be recycled to avoid additional whole of life costs.

Agriculture

Do the Guidelines adequately deal with agricultural land including areas serviced by modernised irrigation infrastructure when considering the location of solar energy facilities? Yes – subject to previous feedback above.

Landscape scale impacts

Are the Guidelines helpful in managing the potential landscape impacts of solar energy facilities? Yes – subject to previous feedback above.

Visual amenity

Are the Guidelines helpful and clear on potential glint/glare, screening or general visual impacts of solar energy facilities?
Yes – subject to previous feedback above.

Off-site impacts

Do the Guidelines adequately address potential off-site impacts of solar energy facilities?
Yes – subject to previous feedback above.